Office of the Commissioner for Aquaculture Development

OCAD
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Federal Programs and Services For Five Resource-Based Industries

by

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FOREWORD

This report was commissioned by the Department of Fisheries and Oceans, and by the Office of the Commissioner for Aquaculture Development. The objectives of the report are:

- to describe the major programs and services of the federal government (particularly those of the lead industry-oriented departments) that provide support for five-resource based industries in Canada;
- to undertake a comparative analysis of the respective program/services frameworks; and,
- to set out some of the implications for the aquaculture industry.

The objective is not for this report to provide (or attempt to provide) a complete, encyclopedic and authoritative description of all the programs and services that provide support for those industries. This is because it was our view that it prove more useful to focus on: the highlights of the programs and services framework; and, to provide a comparative analysis of the programs and services that support the five industries.

This report draws on many public documents that have been produced by government departments and agencies. It also draws on follow-up discussions that were held with federal officials. Some of those officials were kind enough to review and comment on draft sections of this report. Departments, however, were not asked to approve the detailed program descriptions or program summaries contained in this report. In light of the above, the author takes full responsibility for the content of this report, including program descriptions, analysis and commentary.

The analysis for this project was undertaken in early 2001 and the first report was submitted in April of that year. Late in 2002, the author was asked to write a new section on the "implications for the aquaculture industry" (see section 8); hence, a revised report was submitted in December 2002. In should be noted, however, that the descriptions of the programs/services have not been updated; as a result, the current (i.e. revised) report describes the programs/services that existed in early 2001. While there have been some changes in the programs/services over the last 1 and 3/4 years, it is believed that the overall messages and conclusions in this report are still valid.

Finally, we would like to thank the Office of Sustainable Aquaculture within the Department of Fisheries and Oceans, whose financial support made this study possible.

FEDERAL PROGRAMS AND SERVICES
for
FIVE RESOURCE-BASED INDUSTRIES

1. INTRODUCTION

Various federal departments have been assigned the lead responsibility for certain industries. The mandate, programs and services that support these industries vary from lead department to lead department and often from industry to industry.

The Department of Fisheries and Oceans (DFO) and the Office of the Commissioner for Aquaculture Development (OCAD) thought it would be instructive to have a study undertaken on the federal programs and services that are provided by federal departments in support of five resource-based industries. This report provides the findings from that study.

2. THE FIVE RESOURCE-BASED INDUSTRIES

As requested by the clients (i.e. DFO and OCAD), the five industries that are examined in this report are:

- aquaculture
- fisheries (essentially the commercial capture fisheries, thus excluding recreational fisheries and fish processing)
- forestry
- livestock (including cattle, hogs, sheep)
- biotechnology (including related activities in health, pharmaceuticals, agri-food, forestry, fisheries, aquaculture)

The five industries are similar in that they are all resource-based, although some key parts of the biotechnology industry (e.g. health and environmental areas) are not extensively dependent on natural resources. The five industries have a number of significant differences, two of which are cited below:

- federal-provincial jurisdiction
  - the federal government's jurisdictional obligation, for each of the five industries, varies industry-to-industry
  - under the Constitution Act, the federal government has the lead responsibility for fisheries (including aquaculture)
  - aquaculture is, in practice, a shared responsibility
  - under the Constitution Act, the jurisdiction for agriculture (including livestock) is a shared federal-provincial one
  - the Provinces have the lead jurisdiction for the forestry sector, although there is also a role for the federal government

- the issue of "jurisdiction" is not significant in the area of biotechnology as both levels of government are involved through regulation, programs, services, etc

- private property vs. public property
  - some of the five industries are primally conducted on public property, some on private property, and some on a mixture of the two
  - almost all of the primary activity (i.e. harvesting) in the fisheries industry is conducted in public property (i.e. waters under the control of the public sector)
  - most of the aquaculture industry is carried out on private property (either privately owned or privately leased from government)
  - almost all of the primary activity in the livestock industry is carried out on private property
  - most of the primary activity in the forestry industry is carried out on public property (i.e. crown lands, most of which are provincially owned); however, there are also some forestry harvesting operations on private lands
  - the issue of private property vs. public property is not really an issue in the biotechnology industry

As will be seen later in this report, the issues of federal-provincial jurisdiction and private property vs. public property have a significant bearing on the way in which the federal government deals with the five industries in question.

3. LEAD FEDERAL DEPARTMENTS FOR THE FIVE INDUSTRIES

The lead Department for the aquaculture industry is the Department of Fisheries and Oceans (DFO). In addressing the aquaculture industry, DFO addresses the primary activities of the industry (and not the processing, distribution, etc). And, since DFO regards the aquaculture file as being very much a horizontal (i.e. inter-departmental) one, the Department works very closely with many other departments and agencies on aquaculture issues, programs and services.

The lead Department for the fisheries industry is, of course, the Department of Fisheries and Oceans. In addressing the fisheries industry, DFO focuses only on the primary activities of that industry (and not the processing, distribution, etc).

The lead Department for the forestry industry is Natural Resources Canada (NRCan), where the Canada Forest Services (CFS) delivers on the related mandate. NRCan and CFS focus largely on the primary activities of the forestry industry whereas Industry Canada addresses the manufacturing and value-added activities.

The lead department for the livestock industry is Agriculture and Agri-Food Canada (AAFC). It addresses both the primary and secondary activities of the industry.

The lead department for the biotechnology industry is Industry Canada. Since biotechnology covers related developments in areas such as health, agriculture, fisheries and

oceans, forestry, etc — other departments are significantly involved in their respective 'shares' of the biotechnology file. A Biotechnology Secretariat has been set up in Industry Canada to provide leadership on this file and to provide inter-departmental coordination.

4. MANDATES AND ROLES OF LEAD FEDERAL DEPARTMENTS

While the lead federal departments (i.e. DFO, NRCan, AAFC, Industry Canada) for these five industries can be seen as "industry" departments, each of the departments has a different mandate and role in respect of their industries. Some detailed information on this subject is provided in **Annexes I-V**.

In summary terms, it will be seen that AAFC and Industry Canada each have a robust industry-development mandate. By comparison, the industry mandates of DFO and NRCan are far more limited in respect of their industries, focusing more so on research and resource sustainability.

a) Agriculture and Agri-Food Canada (AAFC)

The AAFC mandate talks about the need for the department "to provide information, research and technology, and policies and programs to achieve the security of the food system, health of the environment, and innovation for growth". The Department's vision statement deals, inter alia, with "an innovative and competitive sector ... to be the world leader in the production of food and other related agricultural products and services ...".

As of last year, AAFC has three new business line statements that deal with: "security of the food system"; "health of the environment"; and, "innovation for growth". The business line statements make it clear that AAFC has to respond to the primary, secondary (e.g. "processing") and some tertiary (e.g. "distributing") activities of its industrial sector.

The AAFC business lines also cite departmental responsibilities to: "address financial risk management" in the agri-food industry and "to foster innovation in order to make Canada the world leader in developing food and other related agricultural products that capture opportunities in diversified domestic and global markets".

b) Department of Fisheries and Oceans (DFO)

The DFO mandate deals with matters such as: "conservation and sustainable utilization of Canada's fisheries resources"; the "oceans and freshwater fish habitat"; and, provision of "sound marine services". Unlike the AAFC mandate statement, there are no references to industry innovation, competitiveness, markets, etc.

DFO has eleven business line statements, a few of which deal specifically with fisheries and aquaculture, making reference to departmental responsibilities such as:

- *"to provide fisheries management, the industry and the interested public with a reliable scientific basis for the sustainable development ..."*
- *"to achieve environmental and fish habitat protection and sustainable development ..."*
- *"to conserve and protect Canada's fisheries resource ..."*

In keeping with the mandate statement, DFO's business lines focus on matters such as scientific knowledge, resource and habitat protection, sustainable development. Once again there is no mention of industry innovation, competitiveness, markets, etc. Also there is no mention of the processing (or value-added) side of the fishery industry.

c) Natural Resources Canada (NRCan)

NRCan's mission statement reads as follows:

"Natural Resources Canada provides the knowledge and expertise for the sustainable development and use of Canada's natural resources and the global competitiveness of the resource and related sectors for the well-being of present and future generations".

Interestingly, this mission statement makes reference to "competitiveness" and also to "related sectors" of the resource industry.

NRCan has four business lines which deal with: developing federal policy and regulations; promoting Canada's international interests; science and technology; and, knowledge infrastructure. These business lines (and the expression of them) seem to rein in the department's mission statement to some degree.

d) Industry Canada

Industry Canada's mandate calls for the department "to help make Canadians more productive in the global, knowledge-based economy". It also calls for the department to "help create an economy that ... supports stronger business growth through sustained improvements in productivity".

The department has five strategic objectives that deal with:

- Innovation: improving Canada's innovation performance;
- Connectedness: making Canada the most connected nation in the world;
- Marketplace: being a fair, efficient and competitive marketplace;
- Investment: improving Canada's position as a preferred location for domestic and foreign investment; and,
- Trade: working to increase Canada's share of global trade.

e) Summary

As stated at the beginning of this section,

> *"AAFC and Industry Canada each have a robust industry-development mandate. By comparison, the industry mandates of DFO and NRCan are far more limited in respect of their industries, focusing more so on research and resource sustainability."*

And, as will be seen later in this report (section # 6 below), an even better measure of a department's industry-responsiveness is seen in the specific programs and services that it provides to its industry client(s).

5. FEDERAL PROGRAMS AND SERVICES FOR INDUSTRY

The five industries (aquaculture, fisheries, forestry, livestock, biotechnology) can benefit from a wide range of federal government programs and services that we group under the following headings:

a) Industry-Specific Programs/Services

- the federal government has designed many programs and services for application specifically to one industry or, in some cases, to a few industries that have very similar characteristics and needs
- most of these industry-specific programs and services are offered to the industry in question by the lead department for that industry
- **Annexes I-V** of this report describe the **industry-specific programs/services** that are offered by the lead departments (and a few other partners) respectively for the industries of aquaculture, fisheries, forestry, livestock and biotechnology
- these industry-specific programs are also discussed (in summary terms) in section #6 below

b) Industry-Wide Programs/Services

- "industry-wide" programs/services (e.g. export financing from the Export Development Corporation) are available to all or most industries and, usually upon application, to the individual companies within those firms
- **Annex VI** to this report describes some of the **industry-wide programs/services** under the sub-headings of:

  - research and development (e.g. Natural Sciences and Engineering Research Council, Social Sciences and Humanities Research Council, National Research Council, Technology Partnerships Canada);
  - investment financing (e.g. Business Development Bank of Canada, Small Business Loans Act); and,

- trade and market development (e.g. Export Development Corporation, Program for Export Market Development)

- not described in **Annex VI** are other industry-wide programs/services such as: tax expenditures; human resource development programs (e.g. literacy; training; employment insurance); international development programs (e.g. as offered by CIDA); etc.
- the five industries in question (aquaculture, fisheries, forestry, livestock, biotechnology) all take advantage of many of these industry-wide programs and services)

c) Regional Development Initiatives

- the federal government has four regional agencies[1] that design and deliver a number of programs and services to meet regional development objectives
- some of these regional development programs/services apply to many industries (e.g. support for small and medium-sized businesses)
- other regional development initiatives apply specifically to one industry (e.g. Western Economic Diversification's program for the beef industry)
- the regional development programs and services are not discussed further in this report

6. INDUSTRY-SPECIFIC PROGRAMS/SERVICES

6.1 Introduction

In the following sections, it will be seen that AAFC has a very wide array of programs and services to help the agriculture and agri-food sector (including the livestock industry). AAFC addresses primary, secondary (e.g. processing) and tertiary activities (e.g. distribution) in the livestock industry. The AFFC programs and services seem to run the full gamut, including: research and technology transfer, economic analysis and policy, farm management and safety, industry financing, income support, market access and promotion, food inspection, etc. Not only is the scope of the programming wide but it is also very deep with several programs being available under many of these headings. However, some observers say that the programs that most benefit the livestock industry are those of animal health and meat inspection.

The DFO programs and services in support of aquaculture and fisheries are far more limited, focusing essentially on the resource side of the two industries with the key supports

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[1] Atlantic Canada Opportunities Agency (ACOA); Western Economic Diversification Canada (WD); Canada Economic Development (CED) for Quebec; Federal Economic Development Northern Ontario (FEDNOR).

being in areas such as: science; and, protection of the wild stocks and fish habitat. The Department no longer delivers industry-development programs nor income support programs. The one industry-support program that remains is the small craft harbours program which is of an infrastructure nature.

NRCan focuses very much on the resource side of the forest industry, providing programs/services in areas such as: science and technology; and, forest management. About three-quarters of NRCan's forestry budget is allocated to S&T.

The biotechnology industry is much different than the other four resource-based industries (i.e. aquaculture, fisheries, forestry, livestock) as it is essentially a new industry (dating to the 1980's) that is technology-dependent and technology-driven. While Industry Canada has the lead and coordinating role for this industry, many other departments have the lead in their respective areas (e.g. Health Canada for health biotechnology). Industry Canada and some of its federal partners have recently introduced a number of new programs and services that either focus quite directly on the biotechnology industry or indirectly on it as one of the new, knowledge-based industries that have become a priority in the government's overall industrial strategy.

6.2 Aquaculture

The lead federal department for the aquaculture industry is the Department of Fisheries and Oceans (DFO). That department's programs and services in support of the aquaculture industry seem to be determined largely by the factors of:

- jurisdiction: in practice, the jurisdiction is shared but the Provinces exercise much of the jurisdiction (e.g. leasing/licensing) for the aquaculture industry — although DFO is actively involved in certain areas, particularly in respect of protection of wild stocks and fish habitat
- private property vs. public property: almost all of the industry is conducted on private property (either privately owned or privately leased from government)
- DFO's mandate: the department's mandate focuses on issues of: conservation and protection; and, scientific research and knowledge
- primary vs. secondary activities: DFO's mandate also restricts the department's attention to the primary activities of its industry clients (and not the value-added activities)

Given the above, it is not surprising to find that DFO's programs and services in support of the aquaculture industry focus largely on: science and technology; measures for conservation and protection; and, inter-departmental coordination. These and the other aquaculture-related programs/services of the Department are summarized below (see more details in **Annex I** to this report):

a) Inter-departmental Coordination

- DFO has been assigned the lead federal role for the aquaculture industry and for the related inter-departmental coordination
- in 1995, DFO took the lead inter-departmentally in the articulation of a Federal Aquaculture Development Strategy (FADS)

b) Science and Technology
- through its research centres, DFO delivers on S&T initiatives designed to: promote industry competitiveness and new species development; minimize risks; and, promote the transfer of technology and information (from government research facilities to industry)
- the department also has a new Aquaculture Collaborative Research and Development Program to support industry-driven R&D

c) Economic Analysis and Policy
- the department supports the industry through some data collection, economic analysis, policy development and liaison with the Provinces, industry and other partners

d) Licensing
- although all the Provinces (except P.E.I.) are exercising delegated authority from DFO for aquaculture leases and licences, the department still reviews licence applications and provides advice and recommendations, particularly in respect of conservation and protection

e) Protection of Wildstocks and Fish Habitat
- DFO influences the performance of the industry and individual companies through science, regulatory and decision-making in areas such as: habitat protection; access to wildstock resources and aquatic space; and, fish health protection

f) Investment Financing
- although DFO does not provide any investment financing services to the aquaculture industry, it should be noted that the Farm Credit Corporation (which reports to the Minister of Agriculture) provides loans to the agriculture sector and that it includes the aquaculture industry as one of its industry clients[2]

g) Industry Development
- the Office of the Commissioner for Aquaculture Development (OCAD), reporting

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[2] We include the FCC services under the heading of "industry-specific programs" (as opposed to listing it under "industry-wide programs") because the FCC loans are only available to the agriculture sector, the latter being defined for these purposes to include the aquaculture industry.

to the Minister of Fisheries and Oceans, is administering a three-year partnership program designed to foster industry development through partnership arrangements with universities, industry associations, etc.
- DFO, however, does not have any industry development programs for the aquaculture industry

h) Infrastructure
- in some parts of the country, the aquaculture industry derives benefits from the Department's Small Craft Harbours (SCH) program

i) Inspection
- In terms of promoting consumer confidence, the aquaculture industry derives considerable benefit from the food inspection program which is delivered by the Canadian Food Inspection Agency (CFIA), reporting reporting to the Minister of Agriculture

j) Market Access
- DFO is actively involved in trade analysis and negotiations on behalf of the aquaculture industry; the Department of Foreign Affairs and International Trade (DFAIT) is an active partner in this area of responsibility
- Agriculture and Agri-Food Canada provides some market promotion services that support the food sector, including aquaculture products

6.3 Fisheries

The lead federal department for the fisheries industry is the Department of Fisheries and Oceans (DFO). That department's programs and services in support of the fisheries industry are largely pre-determined by the factors of:

- jurisdiction: the Constitution provides that the jurisdiction for "seacoast and inland fisheries" is a federal one, subsequently entrusted to and administered by DFO
- private property vs. public property: almost all of the industry is conducted in public waters
- DFO's mandate: the department's mandate focuses on issues of: conservation and protection; and, scientific research and knowledge
- primary vs secondary activities: under its mandate, DFO is only responsible for the primary sector; processing facilities are licensed and regulated by the Provinces

Given the above, it is not surprising to find that DFO's programs and services in support of the fisheries focus largely on: science and technology; fisheries management activities; and, fish habitat protection. These and the other fisheries-related programs/services of the department are summarized below (for more details, see **Annex II** to this report):

a) Science and Technology

- through its research facilities across the country, DFO delivers a comprehensive S&T program in support of the fisheries
- key S&T activities deal with matters such as: stock assessments and forecasts; fish health and diseases; reproduction; toxic chemicals; contaminants; water quality; research and technology transfer

b) Economic Analysis and Policy

- the department supports the industry through some data collection, economic analysis, policy development and liaison with the Provinces, industry and other partners

c) Fisheries Management

- DFO has a major impact of the economic performance of the fisheries industry and the individual companies through its regulations and decision-making in areas such as: licensing; establishment of harvest levels and allocations; provisions for access to the resource; monitoring, surveillance and enforcement

d) Habitat Protection

- under the Fisheries Act, DFO has responsibilities to protect fish habitats across the country

e) Income Assistance

- although DFO does not provide any income assistance, Human Resources Development Canada (HRDC) is responsible for the delivery of an Employment Insurance program that is specifically focussed on the needs of unemployed fishers[3]

f) Infrastructure

- in collaboration with the users, DFO is responsible for the funding and delivery of the Small Craft Harbours (SCH) program which provides some 1,160 commercial fishing harbours across the country, serving about 90 per cent of the fisheries industry

g) Inspection

- in terms of ensuring consumer confidence, the fisheries industry derives considerable benefit from the food inspection program delivered by the Canadian Food Inspection Agency, reporting to the Minister of Agriculture

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3 We include HRDC's employment insurance program for fisheries under the heading of industry-specific programs (as opposed to listing it under industry-wide programs) because the program applies only to those employed in the fisheries industry.

h) Market Access and Promotion

- in collaboration with DFAIT, DFO is actively involved in trade analysis and negotiations on behalf of the fisheries industry
- the Freshwater Fish Marketing Corporation, which reports to the Minister of Fisheries and Oceans, has the marketing responsibility for freshwater fish from the three Prairie Provinces, the Northwest Territories and part of northern Ontario
- Agriculture and Agri-Food Canada provides some market intelligence and unfunded services to support food exports, including fish products

i) Aboriginal Programs

- DFO enters into fisheries management agreements with First Nations and also manages a funded program that purchases commercial fisheries licences and transfers them to First Nations fisheries

6.4 Forestry

The scope of NRCan's programs and services in support of the forest industry seem to be determined largely by the factors of:

- jurisdiction: the Provinces have the lead jurisdiction for the forest industry
- private property vs. public property: most of the industry is conducted on provincial crown lands (under the regulation) of the Provinces with smaller shares of the industrial activity being conducted on federal crown lands and on private property
- NRCan's mandate: the department's mandate focuses largely on S&T, federal policy and regulations, and promoting Canada's international interests
- primary vs. secondary activities: NRCan responsibilities are almost exclusively tied to the primary activities of the forest industry (as Industry Canada addresses the needs of the secondary sector, e.g. pulp and paper, lumber)

Given these important considerations, it is not surprising that NRCan's support for the industry is fairly limited in scope and focuses on some strategic interventions to support the primary areas of industry activity (e.g. silviculture, pest control, management practices).

NRCan has a number of industry-specific programs to help the development of the forest industry, particularly in the areas of research, forest management and ensuring sustainable forests over the longer term. These program areas — described at greater length in **Annex III** — are summarized below:

a) Science and Technology

- S&T accounts for about 75 per cent of the forest-related budget of NRCan
- the Canadian Forest Services (CFS) delivers on ten S&T networks (e.g. forest health; forest ecosystem; forestry practices; fire management) through five CFS

research centres across the country

b) Forest Management

- CFS has worked with its partners to support the operation of eleven model forests where innovative approaches to sustainable forest management (including alternative harvesting methods) can be tried and demonstrated

c) Economic Analysis and Policy

- CFS provides support in areas such as: economic analysis (supply/demand trends, industry competitiveness); national forestry database; forestry policy development (e.g. emerging markets; trends)

d) Market Access

- NRCan is actively involved in trade analysis and negotiations on behalf of the forest industry
- in cooperation with the Provinces, the department administers an International Forestry Partnership program which tries to counterbalance negative information disseminated in Canada's key export markets

e) Aboriginal Programs

- in cooperation with the Department of Indian and Northern Affairs, NRCan jointly delivers a program designed to help First Nations to pursue some forest-related initiatives

6.5 Livestock

The scope of AAFC's programs and services in support of the livestock industry seem to be determined largely by the factors of:

- jurisdiction: under the Constitution, the federal government and the Provinces share the jurisdiction for the agriculture (including livestock) industry
- private property vs. public property: almost all of the industry is conducted on private property
- AAFC's mandate: the department has a robust industry support mandate which calls for it to address and support industry competitiveness, profitability, exports, etc
- primary vs. secondary activities: AAFC responsibilities are tied to both the primary and secondary activities of the livestock industry CHECK
- support programs/services abroad: most countries have had a long tradition of providing a wide range of (heavily funded) programs and services to support the agricultural industry

The combination of some of these factors help to explain the extensive involvement of AAFC in the whole agriculture sector, including the livestock industry. The latter industry is eligible for benefits under programs and services provided by AAFC in areas of: science and

technology; investment financing and debt management; income support programs (also known as safety net programs); and, farm management programs. These and other programs/services for the livestock industry are summarized below (for more details, see **Annex IV** to this report):

a) Science and Technology

- through its research centres, AAFC undertakes a wide range of research to: improve the ongoing competitiveness of the industry; develop and transfer innovative technologies; and, promote the environmental sustainability of the resource base
- AAFC also delivers an R&D Matching Investment Initiative to increase collaborative research activity with the private sector

b) Economic and Policy Analysis

- AAFC provides support in areas such as: economic analysis (supply/demand trends, industry competitiveness); national agricultural database; agricultural policy development (e.g. emerging markets; trends)

c) Investment Financing and Debt Management

- reporting to the Minister of Agriculture, the Farm Credit Corporation (FCC) offers loan products to the whole of the agriculture sector, including the livestock industry
- AAFC administers the Farm Improvement and Marketing Cooperatives Loans Act (FIMCLA) program which helps cooperative associations to make improvements and developments in the industry
- the Department provides the Farm Debt Mediation Service (FDMS) to help insolvent farmers
- the Farm Consultation Service (FCS) of AAFC provides confidential management counselling services to farmers

d) Income Support Programs

- in cooperation with the Provinces, AAFC provides safety net assistance to the industry under three major programs — NISA, CFIP and AIDA
- the Net Income Stabilization Program (NISA) helps to stabilize long-term farm income on an individual basis
- the Canadian Farm Income Program (CFIP) provides a safety net to farmers when they experience a sudden and severe drop in farming income for reasons beyond their control
- the Agricultural Income Disaster Assistance (AIDA) program is a two-year safety net program funded 60:40 by the two levels of government

e) Farm Management Programs

- AAFC administers the Canadian Farm Business Management Program (CFBMP) which helps farmers to upgrade their business management skills
- the Department also provides funding for the establishment of Industry-Led

Adaptation Councils which work in consultation with other parties to encourage industry adaptation and diversification

- under the Health of Animals Act, the department can provide compensation to livestock farmers if and when the Minister orders the destruction of their animals for the purposes of disease eradication and control
- there is also the Canadian Agriculture Safety Program (CASP) which provides assistance to help reduce the incidence of agriculture-related deaths and injuries

f) Inspection

- in terms of ensuring consumer confidence, the livestock industry derives considerable benefit from the food inspection program delivered by the Canadian Food Inspection Agency, reporting to the Minister of Agriculture

g) Market Access and Trade Programs

- AAFC is actively involved in trade analysis and negotiations on behalf of the livestock industry
- the Department administers the Agri-Food Industry Market Strategies (AIMS) to help companies develop and implement market responsive strategies
- AAFC delivers the Agri-Food Trade Program (AFTP) to support the industry in areas of market access, market development and investment
- the department also manages a Price Pooling Program to assist the cooperative marketing of agricultural products, including processsed products
- AAFC provides the Agricultural Products-Markets Information Program to provide the industry with timely market and production information
- the Agri-Food Trade Service provides a range of services to help exporters
- loan guarantees are provided under FIMCLA (discussed above) to help cooperatives pursue market development (and other) initiatives

h) Livestock-Specific Programs

- the Prairie Farm Rehabilitation Administration provides 87 community pastures in the three Prairie provinces
- AAFC provides assistance under the Beef Industry Development Fund program (BIDF) for market development, technology training and new research
- the Canadian Dairy Commission has a wide range of programs and services to support dairy farmers

i) Province-Specific Programs

- there are many "companion programs"which AAFC jointly funds with individual Provinces for purposes such as: investment; development; income disaster; debt refinancing; agri-food innovation; forage write-down

6.6 Biotechnology

Over the last decade or so, the federal government's industrial development strategy has focused increasingly on the innovative and knowledge-based industries which offer considerable

growth potential. As a result, many new program measures[4] have been introduced by government to support this industry development and growth. As one such industry, the biotechnology industry has benefitted from this overall industrial development strategy and it has also garnered a lot of individual attention as well. For example, in 1983, Industry Canada produced a national biotechnology strategy which it later updated and extended in 1998. And, last year, the Department produced a follow-up document ("Pathways to Growth: Opportunities in Biotechnology") which set out further strategic directions for and commitments to the industry. In recent years, some new programs and services have been designed and targeted to help the industry realize its enormous potential.

The Minister of Industry Canada, with his wide array of responsibilities[5], now has many programs and services that provide benefits to the biotechnology industry. Some of those are summarized below:

a) Research Programs

- federal funding for Geonome Canada provides considerable support for the biotechnology industry
- the National Research Council has a number of research institutes that focus on aspects of the biotechnology industry
- some of the Networks of Centres of Excellence provide assistance for specifically for biotechnology research
- the Canada Foundation for Innovation, heavily reliant on federal funding, provides assistance to the biotechnology industry
- the granting councils (e.g. NSERC, SSHRC) provide assistance to researchers in the biotechnology field

b) Technology Development

- the Technology Partnerships Canada (TPC) program of Industry Canada places a high priority on providing assistance to the biotechnology industry
- the Industrial Research Assistance Program (IRAP) of the National Research

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4 Examples are: Networks of Centres for Excellence, Geonome Canada funding, Canada Foundation for Innovation, Canada Research Chairs, Canadian Institutes of Health Research, increased funding for the granting councils, Technology Partnerships Canada.

5 Including Industry Canada, the regional development organizations, the granting councils (e.g. NSERC, SSHRC), National Research Council, Business Development Bank of Canada, Export Development Corporation, Canadian Commercial Corporation, Canadian Space Agency, etc.

Council provides considerable assistance to the biotechnology industry
- the regional development agencies also provide some assistance for biotechnology development

c) Regulatory Reform
- in the 2001 Budget, new funding was provided to undertake regulatory reform in several departments so as to help the biotechnology industry to further develop and to ensure consumer confidence

d) Other Programs
- investment financing is available from the Business Development Bank of Canada and the Small Business Loans Act of Industry Canada
- export financing and other assistance are available from the Export Development Corporation and the Canadian Commercial Corporation

7. SUMMARY AND CONCLUSIONS

The basic purpose of this report was to describe and assess some of the key federal programs and services that provide support to five resource-based industries, those being: aquaculture; fisheries; forestry; livestock; and, biotechnology.

As was noted in the report, the five industries are similar in that they are resource-based[6]. Three of the industries — fisheries, forestry and livestock — have long histories in Canada, dating back to the pre-Confederation days. Commercial aquaculture and biotechnology, however, are much newer industries, effectively dating back to the early 1980's. While technology is important to all five industries, it is the driver and dominating feature in the biotechnology industry. As was noted in this report, R&D expenditures in the biotechnology industry now equal about 60 per cent of the industry's sales.

Jurisdiction is a major consideration in four of the industries. The federal government has the lead jurisdiction in fisheries. In agriculture and aquaculture, the jurisdiction is shared by the federal and provincial levels of government. In forestry, the jurisdiction is basically provincial. In biotechnology — a knowledge-based industry — the jurisdiction is not an issue. In all five industries, the federal government has a major role to play but the nature of the role varies from industry to industry.

For the purposes of analysis, this study grouped the federal government's industry-oriented programs and services under three headings:

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[6] In the case of the biotechnology industry, parts of it are resource-based but other parts (e.g. health and environmental areas) are not extensively dependent on natural resources.

- "industry-specific" programs and services
  - these are the programs/services that were basically designed for application to one industry (e.g. livestock) or industry sector (e.g. agriculture)
  - these programs/services are often delivered by the lead department for the industry in question
  - this report places most of its attention on the industry-specific programs/services that apply to the five industries being examined herein

- "industry-wide" programs and services
  - these are the programs and services (e.g. investment financing, export financing) of government that are open to most industries and industry sectors
  - most of the assistance under the industry-wide programs are subject to applications (for assistance) being made by individual companies and submitted to government for decision-making
  - this report does not attempt to deal at length with this type of programs and services (although Annex VI provides some information on that subject)

- "regional development" programs and services
  - these are programs and services that are regionally targeted and delivered by the government's regional development agencies (i.e. ACOA, CED, WD, FedNor)
  - this report does not deal with these programs/services

This study examined the mandates for the four lead departments for the five industries, those being: Agriculture and Agri-Food Canada (AAFC) for the livestock industry; the Department of Fisheries and Oceans (DFO) for the aquaculture and fisheries industries; Natural Resources Canada (NRCan) for the forestry industry; and, Industry Canada for the biotechnology industry. The report found that:

> *"AAFC and Industry Canada each have a robust industry-development mandate. By comparison, the industry mandates of DFO and NRCan are far more limited in respect of their industries, focusing more so on research and resource sustainability."*

In this regard, it might also be noted that AAFC has a mandate that relates to primary, secondary and tertiary (e.g. distribution) activities of its industry clients whereas NRCan and DFO have to focus on the primary activities.

This report argued that, while departmental mandates (and business lines) are important, a far better measure of a department's industry-responsiveness is seen in the industry-specific programs and services that it provides to its industry client(s). In that regard, the report attempted to demonstrate that:

- The livestock industry is eligible for assistance under a very wide (and deep) program and service framework. Unlike fisheries, forestry and aquaculture — the livestock

industry can look to its lead department (i.e. AAFC) for "industrial development" support in areas such as: income (or safety net) assistance; investment financing; debt management; trade programs; etc. The livestock industry also looks to AAFC for support in areas such as: research; technology development; farm management; etc. And, of great importance to this industry are services from AAFC and CFIA in respect of animal health and meat inspection.

- The biotechnology industry looks to its lead department (Industry Canada) for leadership on the biotechnology file and for "industrial development" support through new programs and services in areas such as: research; technology development; regulatory reform; and, increased access to industry-wide programs and services.

- The aquaculture, fisheries and forestry industries do not look to their lead departments for "industrial development" programs.

- The aquaculture industry basically looks to its lead department (DFO) for: science and technology; measures for conservation and protection; and, inter-departmental coordination.[7]

- The fisheries industry primarily looks to its lead department (DFO) for: science and technology; fisheries management activities; and, fish habitat protection. Another important support program of the department is the small craft harbours program.

- The forestry industry primarily looks to its lead department (NRCan) for support in respect of: research; forest management; and, helping to ensure that Canadian forests are sustainable over the longer term.

It should be noted that this report dealt at length with the issue of industry eligibility under federal programs and services. It was beyond the scope of this report to move to the next stage of analysis and try to determine the actual level of benefits that each industry derives from that eligibility. In fact, the federal government does not collect and maintain data on this basis (i.e. for the full range of federal assistance to the aquaculture industry and other industries).

8. IMPLICATIONS FOR THE CANADIAN AQUACULTURE INDUSTRY

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7 The aquaculture industry also looks to DFO to deliver on its Federal Aquaculture Development Strategy (FADS) and, in keeping with that, to exercise its lead department responsibilities for: "coordination" (with federal and other partners); "policy" development; "advocacy" (i.e. on behalf of the industry); and, "liaison" (i.e. the promotion of increased dialogue and communication among all stakeholders).

The question might now be asked: "What does all of this mean for the Canadian aquaculture industry"? We will try to provide some of the answers in the following paragraphs.

As an opening comment, it is important to recall that the primary responsibility for industrial development, expansion and profitability rests with the industry in question. Governments should have only a supportive role (e.g. ensuring that a suitable business environment exists, providing selected assistance that addresses public policy objectives). In respect of aquaculture, the Federal Aquaculture Development Strategy (FADS) of 1995 argued that:

> *"The aquaculture industry is responsible for its own commercial success and competitiveness. It is up to industry to seize opportunities for commercial development and strive to remain competitive in a global economy."*

The Federal Aquaculture Development Strategy also addressed the role of government vis-a-vis the aquaculture industry, stating that:

> *"Government provides responsible stewardship of the public aquatic resources while leaving the aquaculture industry with sufficient latitude to conduct business economically .... Essentially, the government plays a catalytic role in promoting industry development."*

The aquaculture industry has its own unique relationships with government(s) — much different, for example, than those of the softwood lumber, steel, culture, high tech and retail industries. For the Canadian aquaculture industry, some of the key determinants of the nature of its industry-government relationships are due to:

- aquaculture as a "new, emerging industry" (e.g. unlike agriculture, forestry)
- the shared jurisdiction for aquaculture in Canada (e.g. with the Provinces taking the lead on site approvals and leasing/licensing)
- the competing demands (e.g. from boaters, cottagers, shipping) for aquatic space
- the industry's major interface with environmental issues and concerns
- the export orientation of much of the aquaculture industry
- the industry's heavy reliance on R&D and new technology
- aquaculture as part of the overall "food sector" where issues of safety and quality are of paramount concern

At the federal level, the aquaculture industry is impacted by a wide range of public policy instruments, such as:

- tax policy
- fisheries legislation and regulations, most of which were designed decades ago to apply to the capture fisheries (i.e. long before the aquaculture industry was even a modest player on the fisheries scene)

- trade policy, as it relates to inter-provincial and international trade (particularly within the NAFTA area)
- environmental policy (e.g. in respect of fish habitat protection)
- fish health policy
- food inspection

In terms of federal programs and services, the aquaculture industry benefits from the three types of programs/services discussed in this report:

(a) industry-specific programs/services

Some of the key programs in this regard are: DFO's science program and its Aquaculture Collaborative Research and Development Program (ACRDP), CFIA's inspection program (which provides assurances to the consumer of food safety) and FCC loans. Some of the key services include work by DFO on matters such as: leasing/licensing; trade negotiation and resolution of trade issues; fish health; access to aquatic resources; etc. And, DFO also has responsibility for ensuring the implementation of FADS — one of the federal government's very few industry strategies — that is targeted solely on the aquaculture industry.

When the aquaculture industry is compared to the agriculture/livestock industries — in terms of eligibility under Government of Canada industry-specific programs — a few observations leap out:

- First, there are far fewer programs of this nature that apply to the Canadian aquaculture industry;
- Second, unlike the agriculture/livestock industries, the aquaculture industry is not eligible for assistance under federal programs that deal with matters such as: investment financing; debt management; income support and stabilization; crop insurance; farm management; compensation for the ordered eradication of stocks; price pooling; markets information; marketing loans; etc; and,
- Third, AAFC, as the lead federal department for the agriculture/livestock industries, is heavily supportive of "industry development and competitiveness" whereas DFO, as the lead federal department for the aquaculture industry, is not.

Because of these considerations, many aquaculture industry representatives have long argued (and continue to argue) that their industry — as a private property farming industry and as a key part of the food sector — should be made eligible for some or all of the AAFC programs that support the development and competitiveness of other parts of the farming and food sectors.

(b) industry-wide programs/services

The Canadian aquaculture industry benefits from a number of federal programs that

apply to many industries. Some of the key programs in this regard are: EDC's financing and insurance programs; loans from the Business Development Bank of Canada; market assistance under the Program for Market Export Development (PEMD); R&D by the National Research Council and NSERC; training by HRDC; etc.

This study/report reviewed some of the federal government's industry-wide programs and services that are available to industries such as the aquaculture industry. Based on that review and also our experience with the programs, it appears that there is scope for increasing the benefits that flow to the aquaculture industry under such programs. Realizing that potential will call for increased efforts by a number of parties (e.g. DFO as the lead federal department; other federal departments/agencies; the Canadian aquaculture industry association; individual aquaculture companies).

(c) regional development programs/services

The Canadian aquaculture industry has also benefitted from targeted assistance from three of the federal government's regional development agencies, those being ACOA, WD and CED/Quebec. While some of that assistance has been very significant, this study/report did not investigate that topic. However, based on our knowledge of these programs, it appears that there is scope for further matching the interests of the aquaculture industry with those of the regional development agencies, particularly in respect of new and emerging areas of "regional development" attention, such as: innovation, productivity, SMEs, etc.

A few final comments are now offered.

Aquaculture is part of the "food sector" and, internationally, it has been the fastest growing part of that food sector over the last three decades. In many jurisdictions (e.g. the USA), governments include the aquaculture industry in its programs/services for the food sector. In Canada, this is the case with a number of Provinces whereas, at the federal level, aquaculture is part of the "fisheries and oceans" responsibilities of DFO rather than the "agriculture and agri-food" responsibilities of AAFC. Organizational and mandate decisions, such as these, can have a major impact on the programs/services that are offered to an industry.

Given the analysis and discussion above, there are a number of related questions that now come to mind, such as:

- is there a need for the federal government to harmonize the now disparate strategic and program approaches of AAFC and DFO vis-a-vis different industries within the food sector?
- should the aquaculture industry be treated by the federal government on a comparable basis with the agricultural/livestock industries?
- is there a strong case to be made for seeking the eligibility of the Canadian

aquaculture industry under various AAFC programs? if so, which programs?

- while there are different "lead federal departments" for different industries, what is the scope for better handling the inter-departmental responsibilities (e.g. so that there is more of a level playing field for those industries, particularly those that are in the same sector)?

It is hoped that this report will contribute to some of the strategic thinking and action that is required on the part of those who are interested in the further development of Canadian aquaculture as a sustainable and highly competitive industry in global markets.

ANNEX I

AQUACULTURE: INDUSTRY-SPECIFIC PROGRAMS AND SERVICES

1. THE INDUSTRY

In 1998, the Canadian aquaculture industry had a production of about 92,000 tonnes with a value of $443 million, representing about one-quarter of the total landed value of Canadian fish and seafood. More that 70 per cent of the aquaculture production was sold in export markets. The aquaculture industry employed about 14,000 people in both direct and indirect jobs (e.g. service and supply industry). Each year, aquaculture adds over $700 million to Canada's economy, including production and related goods and services.

2. FEDERAL-PROVINCIAL JURISDICTION

The jurisdiction for aquaculture is shared, federally and provincially. The Constitution Act assigned "seacoast and inland fisheries" responsibilities to the federal government to the federal government and "property and civil rights" to the Provinces; the latter give the Provinces part of the jurisdiction over aquaculture since the industry's operations depend heavily upon the exercise of private property rights. As a result, the operations of the aquaculture industry in Canada are regulated by the two levels of government. The Provinces and Territories have the responsibility for the majority of site approvals (i.e. licensing) and for overseeing the industry's day-to-day operations. The federal role involves such areas as: conservation of fish stocks and fish habitat; regulation of fish products marketed in interprovincial and export trade; approval of vaccines and therapeutants; importation into Canada and inter-provincial movements of live salmonids and eggs: research; etc. Federal regulations are applied by federal departments and agencies such as DFO, Environment Canada, the Canadian Food Inspection Agency, Health Canada and others. Other federal departments and agencies are also involved in aspects of the industry related to research, technology development and transfer, access to financing, marketing, etc.

3. DFO AS LEAD FEDERAL DEPARTMENT

3.1 Inter-departmental Coordination

The Department of Fisheries and Oceans (DFO) has the lead responsibility at the federal level for addressing the needs of the aquaculture industry. In exercising this responsibility, DFO provides policy leadership and works very closely in a coordinating role with many other federal departments and agencies that have programs/services impacting on the industry.

3.2 Federal Aquaculture Development Strategy

In 1995, DFO worked with other federal departments and agencies to produce a Federal

Aquaculture Strategy (FADS). The strategy was designed to support the sustainable development of the aquaculture industry. The key elements of the strategy — and the responsibilities of the individual partners — were set out under the following headings:

- "research" — to support industrial development and also to support the government's statutory responsibilities (e.g. for health, safety, environmental protection)
- "technology transfer" — to facilitate the transfer of technology to industry, research institutes, etc.
- "training and development" — to encourage the training of an aquaculture labour force with strong technical and other skills
- "regulatory framework" — to ensure that the existing regulatory framework is up-to-date and properly balances the government's statutory obligations along with the objective of industrial growth and competitiveness
- "environmental sustainability and interaction" — to ensure that aquaculture is conducted in an environmentally sustainable fashion and that it is not detrimental to its aquatic environment
- "resource allocation and access" — to provide appropriate access by the industry to seedstock and to coastal and inland aquatic resources
- "production safety and inspection" — to ensure consumer confidence in product safety and quality
- "market intelligence and services" — to foster industry success in domestic and export markets
- "access to financing" — to foster industry access to investment and operating capital
- "communications" — to promote public awareness and understanding of aquaculture
- "performance measurement and improvement" — to ensure that the goals of FADS are met

4. OFFICE OF COMMISSIONER FOR AQUACULTURE DEVELOPMENT

4.1 Mandate

The Office of the Commissioner for Aquaculture Development (OCAD) was set up in the year 1998. Reporting directly to the Minister of Fisheries and Oceans, the mandate of OCAD is:

> "To bring together all appropriate federal resources, lead required regulatory reforms, and work with the Provinces to develop a vibrant, environmentally sustainable aquaculture industry."

OCAD also has a responsibility for overseeing the implementation of the 1995 Federal Aquaculture Development Strategy (FADS).

OCAD's responsibilities related to industry development and sustainable practices include the following:

- determining impediments to the industry's development and working to overcome these, including cumulative impacts on the industry of taxes and fees imposed by governments;
- encouraging the development of new aquaculture products and the expansion of markets for existing Canadian products;
- encouraging R&D to assist in the commercialization of new species and the development of new technologies; and,
- promoting sustainable practices in aquaculture with respect to human and fish health.

5. PROGRAMS AND SERVICES

The immediately following sections of this report deal with the key industry-specific programs and services provided by DFO — and a few other agencies — in support of the aquaculture industry. These programs and services are grouped under the headings of:

- inter-departmental coordination
- science and technology
- economic analysis and policy
- licensing
- protection of wildstocks and fish habitat
- investment financing (i.e. services provided by the Farm Credit Corporation)
- industrial development (i.e. a program delivered by OCAD)
- product safety
- infrastructure (i.e. the SCH program)
- inspection (i.e. as delivered by CFIA)
- market access and promotion

5.1 Inter-departmental Coordination

As noted above, DFO has been assigned the lead federal role for the aquaculture industry. In keeping with this, DFO took the lead in developing a Federal Aquaculture Development Strategy (FADS). The Office of the Commissioner for Aquaculture Development is also instrumental in delivering on some aspects of the coordinating role.

5.2 Science and Technology

a) DFO's Science Program

DFO's aquaculture science program is aimed at the conduct of research and the transfer of the latest technologies to the aquaculture industry. DFO scientists monitor wild and cultured stocks of wild and cultured finfish and shellfish for diseases and carry out research on the interactions between wild and cultured stocks. They are also responsible for implementing regulations and carrying out inspections to ensure the health of Canada's wild and cultured fisheries resources. The aquaculture science program has three dimensions:

i) research that promotes industry competitiveness and new species development, including research on:
   - new candidate species (e.g. halibut, clams, scallops, sablefish)
   - genetics and broodstock development
   - nutrition and physiology (e.g balanced diets, feed formulations, feeding methods)
   - matters to support Canada's position in international trade disputes involving aquaculture products

ii) research that minimizes risks, including research on:
   - fish health, protection, disease, control and prevention
   - introduction and transfer of cultured stocks
   - genetic interaction between cultured and wild stocks
   - the impact of feed and drug residues
   - the effects of waste accumulations.

iii) the transfer of technology and information, including:
   - consultation and technology transfer (i.e. from DFO labs to the industry)
   - international collaboration

b) Aquaculture Collaborative Research and Development Program (ACRDP)

In the fall of 2000, ACRDP was introduced as a five-year, $20 million industry-driven R&D program. Administered by DFO, the program provides funds for R&D projects that are proposed and jointly financed by private sector partners. Eligible projects include research that:

- reduces production costs, increases competitiveness, achieves greater efficiencies
- generates knowledge on new species (e.g. sea urchins, sablefish and haddock)
- generates technological innovation related to currently utilized species
- develops hatchery and grow-out technology

5.3 Economic Analysis and Policy

In cooperation with the Provinces, DFO maintains a database on the aquaculture industry and regularly provides data on matters such as: production, sales, expenses, salaries and wages, exports, imports, etc.

The department also periodically undertakes economic analysis on the industry re: production and sales potential; trends; markets; etc. And DFO works regularly with the industry, industry associations, Provinces/Territories and others to develop new policy and to make policy adjustments.

5.4 Licensing

DFO has delegated its aquaculture leasing and licensing authority under the Fisheries Act to the Provinces (except Prince Edward Island which chose not to accept it). That arrangement notwithstanding, DFO cooperates with the Provinces in their administration of one-stop shopping for aquaculture leases and licences. In this regard, the Provinces refer aquaculture lease and licence applications to DFO for its review and comment, given DFO's wide range of responsibilities (e.g. for the protection of wild stocks; for the maintenance of the "navigability" of certain waters).

5.5 Protection of Wildstocks and Fish Habitat

A key objective of DFO is the conservation and protection of fisheries stocks (i.e. the "common property") and fish habitat. In carrying out this responsibility, DFO has regulatory and decision-making authority in a number of areas that are of crucial importance to commercial aquaculture activities. A few examples are cited immediately below:

a) Habitat Protection

DFO is responsible for the protection of fish and their habitat, including the prevention of:

- the harmful alteration, destruction or disruption of fish habitat;
- the deposit of deleterious substances in fish habitat; and,
- new obstructions to fish passage.

To fulfill this responsibility, DFO must ensure that all users of the fishery resources, including wild and cultivated fisheries and native, and recreational, and commercial users, do not harm the natural fish habitat.

Prior assessment and approval of new aquaculture ventures is critical for ensuring that a proposed aquaculture site and its planned operation will not be deleterious to the fish habitat. DFO assesses proposed projects for their potential impacts on existing fisheries and fish habitat and recommends to the Provincial leasing/licensing authority whether such projects should be approved, rejected or modified. And, as part of its habitat protection activities, DFO carries out selective compliance monitoring.

b) Access to Resources and Aquatic Space

Although it is the Provinces (with the exception of PEI) that handle the leasing and licensing of commercial aquaculture activities, DFO has a key related role in authorizing access to
some wildstock resources (e.g. for broodstock purposes) and to some aquatic areas (e.g. oyster beds) for culture purposes. DFO's related regulations and decision-making can be critical to the success of some commercial aquaculture activities, re new ventures, expansion and diversification.

c) Fish Health Protection Regulations

Many times a commercial aquaculture operation will wish to use, for culture purposes, some eggs or fish that are not "native" to that area and hence must be imported from some other province or country. In such cases, the Fish Health Protection Regulations (FHPR) of DFO can be an enabling or restraining mechanism. The FHPR govern the introduction or transfer of exotic or natural stocks so as to prevent the introduction of diseases, pathogens and parasites.

5.6 Investment Financing

The Farm Credit Corporation (FCC), which is a crown corporation reporting to the Minister of Agriculture, provides loans to meet the needs of Canada's primary producers and small to medium-sized agribusiness. While designed primarily for the crop and livestock industries, this program also has loan products for the aquaculture industry (i.e. salmon, freshwater fish and shellfish operations).

FCC loans can be for any farm-related purposes, such as: land, buildings, equipment, land improvements, quota, livestock, agribusiness or value-added enterprises and diversification initiatives. Loans are made along four major lines:

- AgriStart for beginning and developing farmers, including the transfer of farming operations from one generation to another, as well as assisting developing farmers in starting or expanding their operations;
- pre-approved loans;
- loans for equipment and livestock, using security other than real estate; and,
- loans for value-added processing and farm diversification projects.

5.7 Industry Development

The Aquaculture Partnership Program (APP), administered by the Office of the Commissioner for Aquaculture Development, is a three-year program (terminating in March 2002) that has funding of $600,000 per year. The objectives of the program are to assist the development of the Canadian aquaculture industry by funding projects that: promote partnership action; embrace a national or regional scope (as opposed to a private interest); and, promote the development of new production techniques. Eligible recipients include individuals or organizations (e.g. industry associations, colleges, universities) operating within Canada who are directly involved in the aquaculture industry. Under the program, OCAD will reimburse up to 80 per cent of total eligible project costs to a maximum of $150,000 per project.

5.8 Product Safety

Under the Canadian Shellfish Sanitation Program (CSSP), DFO monitors shellfish production areas to ensure that the waters and the related products are not subject to shellfish poisoning. The objectives of this program are: to ensure the safety and quality of shellfish

products; and, to promote consumer confidence in those products.

Environment Canada (EC) and the Canadian Food Inspection Agency (CFIA) undertake activities related to: water testing and examination of points of pollution; monitoring of product in fish processing facilities; and, shellfish toxin monitoring. DFO undertakes related activities in the areas of: managing shellfish harvesting; closing areas on recommendations from EC and CFIA; and, publicizing and patrolling closed areas.

5.9 Infrastructure

As will be later noted in the section on "Fisheries" in this report, DFO has a Small Craft Harbours program which currently maintains some 1,160 harbours across Canada for the use of the commercial fisheries industry. In several locales (e.g. Lime Kiln Bay, New Brunswick), the aquaculture industry is able to benefit from this infrastructure support.

5.10 Inspection

Reporting to the Minister of Agriculture and Agri-Food, the Canadian Food Inspection Agency (CFIA) has responsibilities for food safety, plant protection and animal health.

CFIA has a Fish, Seafood and Production Division whose responsibility is to develop and promote appropriate product and process standards that contribute to the achievement of acceptable quality, safety and identity of fish and seafood products, and to provide reasonable assurance of compliance with these standards.

Among its activities, the Division undertakes the following:

- development of standards
- ensuring industry compliance with standards
- inspection of fishing vessels, facilities for offloading and holding of fish prior to processing, vehicles used in transportation of fish, fishers' packer facilities, cold storages and processing facilities
- inspection of fish and seafood imports
- maintenance of databases on contaminants in fish and fish products

5.11 Market Access and Trade Promotion

DFO maintains a trade capacity within its organisation. In keeping with this, a small number of staff have the responsibility for trade policy which will improve market access for Canadian fisheries exports and defend DFO policy and programs against trade challenges by foreign countries. The trade policy staff are supported on many issues by the science staff of the Department who provide advice from the science and fish health perspectives.

This trade responsibility in DFO is carried out in close cooperation with the Department of Foreign Affairs and International Trade (DFAIT). Often DFO takes the lead in the analysis and the discussions with fisheries partners whereas DFAIT often takes the lead on international negotiations, particularly where they are part of a wider set of negotiations (i.e. involving many products other than fish products). The DFO work in this area is designed to help advance the economic interests of the Canadian fisheries sector as a whole. This trade assistance is not company-specific and it does not provide financial assistance or subsidies.

AAFC has been assigned the lead for the market promotion of food products, including food products from the aquaculture industry. While AAFC does not have a funded program, it provides information and some other services to exporters.

ANNEX II

FISHERIES:
INDUSTRY-SPECIFIC PROGRAMS AND SERVICES

1. THE INDUSTRY

Canada has one of the world's most valuable commercial fishing industries, worth almost $5 billion a year and providing more than 120,000 jobs to Canadians. In 1999, the Atlantic fishery accounted for 80 per cent of total landings, followed by the Pacific fishery with 16 per cent and the freshwater fishery with 4 per cent.

Canada exports more than three-quarters of its fish and seafood production to more than 80 countries. In 2000, exports (495,976 tonnes) were valued at $4.0 billion, up 8.7 per cent form 1999. The United States is Canada's largest export market (accounting for 70 per cent of those exports), followed by Japan and the European Union. Canada's fish and seafood imports in 2000 were $2 billion, resulting in a trade surplus of $2 billion.

2. FEDERAL-PROVINCIAL JURISDICTION

In Canada, the federal and provincial levels of government share jurisdiction over the fisheries. Under section 91 (12) of the Constitution Act of 1867, the federal government has exclusive legislative authority over "seacoast and inland fisheries". Under section 92 (13), the Provinces have the authority to legislate with respect to property and civil rights.

Over time, the courts have given interpretation to the Constitution Act as it applies to the fisheries sector. As a result, the practice is that, in non-tidal waters, the Provinces have authority in respect of property rights and they may enact legislation concerning such matters as leases, conveyances and succession to proprietary fisheries, subject to federal regulations on fishing seasons and manner of fishing and other conservation matters.

In tidal waters, there are no property rights in the fisheries. As a result, the Provinces have no jurisdiction over those waters except to the extent that provincial laws can infringe on federal/provincial jurisdiction via the constitutional doctrine of "necessarily incidental effect". In tidal waters, the federal government essentially has exclusive fisheries jurisdiction.

Flowing from the Constitution Act, the federal government has responsibility for the conservation and protection of fisheries in inland waters but the federal government has, through administrative arrangements, delegated to most Provinces (i.e. Alberta, Saskatchewan, Manitoba, Ontario, Quebec, the Yukon and eastern British Columbia) the authority for the management of freshwater fisheries.

Provincial and territorial governments also protect the fishery resources and fish habitat

through their own legislation covering water pollution and fish habitat in intra-provincial waters.

The Provinces and Territories have full responsibility for the processing sector. They license and regulate all processing plants. The federal government, however, is responsible for inspecting seafood that is going to be exported inter-provincially or internationally. Part of the inspection responsibility is handled at the plant site.

3. FISHERIES AND OCEANS CANADA

3.1 Mandate

The Department of Fisheries and Oceans, on behalf of the Government of Canada, is responsible for:

- policies and programs in support of Canada's economic, ecological and scientific interests in the oceans and freshwater fish habitat;
- the conservation and sustainable utilization of Canada's fisheries resources in marine and inland waters; and,
- safe, effective and environmentally sound marine services responsive to the needs of Canadians in a global economy.

3.2 Vision

The DFO vision statement calls for: safe, healthy, productive waters and aquatic ecosystems, for the benefit of present and future generations, by maintaining the highest possible standards of:

- service to Canadians
- marine safety and environmental protection
- scientific excellence
- conservation and sustainable resource use

3.3. Business Lines

The department has eleven business lines (as noted below):

- Marine Navigation Services
  - ➢ to provide safe, efficient and accessible waterways
- Marine Communications and Traffic Services
  - ➢ to ensure safety of life at sea, protection of the environment, efficient movement of shipping, and information for business and national interests
- Icebreaking Operations
  - ➢ to facilitate safe and efficient movement of marine traffic through ice-covered waters and to decrease the risk of flooding in areas prone to or threatened by it as

a result of ice build-up

- Rescue Safety and Environmental Response
  - ➢ to save lives and protect the marine environment
- Fisheries and Oceans Science
  - ➢ to provide fisheries management, the industry and the interested public with a reliable scientific basis for the sustainable development of marine aquaculture; and, scientific information on ocean and coastal waters and marine and freshwater ecosystems in support of environment and fish habitat management, integrated resource management, offshore development, climate prediction, marine services, coastal engineering, defence and shipping
- Habitat and Environmental Science
  - ➢ the objective of the Habitat Management and Environmental Science component is to achieve marine environmental and fish habitat protection and sustainable development of oceans and ocean resources
  - ➢ the objective of the Oceans component is to achieve an integrated ecosystem approach to the conservation, protection and sustainable development of oceans and ocean resources
- Hydrography
  - ➢ to provide nautical information products for safe and efficient navigation in Canadian and bordering international waters
- Fisheries Management
  - ➢ to conserve and protect Canada's fisheries resource and, in co-operation with stakeholders, to ensure its sustainable utilization
- Harbours
  - ➢ to keep harbours, critical to the fishing industry, open and in good repair
- Fleet Management
  - ➢ to provide efficient sea and air support to Fisheries and Oceans program areas
- Policy and Internal Services
  - ➢ to support the Department's mandate by facilitating the management of its human, physical or fixed, financial, administrative, information and information technology resources and assets; as well, to provide advice and expertise for identifying and responding to departmental and government-wide priorities — for strategic planning; for policy research, development and analysis; for intergovernmental relations; and, for legislative and regulatory renewal

4. FISHERIES PROGRAMS AND SERVICES

The immediately following sections of this report deal (almost exclusively) with the key industry-specific programs and services provided by DFO — and a few other departments and agencies — in support of the fisheries industry. These programs and services are grouped under the headings of:

- science

- economic analysis and policy
- fisheries management
- habitat protection
- income support (i.e. the employment insurance provided by HRDC)
- infrastructure (i.e. the SCH program)
- inspection (i.e. the program delivered by CFIA)
- market access
- Aboriginal programs

4.1 Science

Through its many research facilities across the country, DFO maintains and delivers a comprehensive science program which, among other things, focuses on:

- providing timely and reliable scientific knowledge and advice on key aquatic resources and their environments
- monitoring resources and their environments, maintaining related databases and providing information
- maintaining scientific capacity, assessing risks and developing resource management practices, regulations and standards
- transferring knowledge to clients, the public and the media to foster protection, conservation, sustainable development and safe navigation
- identifying and defining DFO's key roles for marine and freshwater science in interaction with its partners

4.2 Economic Analysis and Policy

In cooperation with the Provinces, DFO maintains a database on the fisheries industry and regularly provides data on matters such as: production, sales, expenses, salaries and wages, exports, imports, etc.

The department also periodically undertakes economic analysis on the industry re: production and sales potential; trends; markets; etc. And DFO works regularly with the industry, industry associations, Provinces/Territories and others to develop new policy and to make policy adjustments.

4.3 Fisheries Management

Largely because the fisheries is a "common property" (i.e. owned by all Canadians), the Department of Fisheries and Oceans is responsible for the conservation and protection of the fisheries resource. To exercise these responsibilities, DFO delivers a number of fisheries management services. Some of the ones that have the greatest impact on the economic performance of the fisheries are those of: licensing; establishing annual harvest levels and allocations; providing for access; and, delivering on DFO's responsibilities for monitoring,

surveillance and enforcement.

a) Licensing

The Department of Fisheries and Oceans registers commercial fishing enterprises and vessels, and issues fishing licences in waters (e.g. all marine waters) under its jurisdiction. These licensing decisions determine the size of the commercial fleet, the number of vessels, the ownership of the vessels, the types of vessels, the stocks they can exploit, vessel capacity, etc. Licensing decisions also determine the number of fishers, the nationality of the fishers, their professional level, etc. DFO's licensing policies are therefore a major determinant of the size and nature of the commercial fishing industry, its geographical dispersion and the number/type of the industry participants.

b) Harvest Levels and Allocations

Each year, the Minister of Fisheries and Oceans — upon receipt of the advice/recommendations of scientists, industry and others — determines how much of individual stocks (e.g. herring, snowcrab, scallops) can be harvested and then (for many stocks/fisheries) allocates the allowable catch among competing interests (e.g. recreational vs. commercial; inshore vs. offshore). In some cases, allocation arrangements are built into licences. In any event, the decisions of the Minister with respect to harvest levels and allocations are key to the economic performance of the industry and its participants.

c) Access

The Minister and his department have many regulatory and decision-making powers that determine the industry's access (e.g. in respect of: location, opening and closing of fishing season) to the fisheries resource. Decisions of this nature also have a major impact on the economic performance of the industry and its participants.

d) Monitoring, Surveillance and Enforcement

The department has a responsibility — which it regularly executes — to monitor the fishing activity, to provide surveillance vis-a-vis departmental policies/regulations, and to enforce those regulations/decisions. For example, some of these activities will address: illegal fishing; excessive catches; high-grading; dumping; etc. The department's monitoring, surveillance and enforcement activities affect the economic performance of the industry and its participants.

4.4 Habitat Protection

DFO is responsible for the protection of fish and their habitat, including the prevention of:

- the harmful alteration, destruction or disruption of fish habitat;
- the deposit of deleterious substances in fish habitat; and,
- new obstructions to fish passage.

To fulfill this responsibility, DFO must ensure that all users of the fishery resources, including wild and cultivated fisheries and Native/recreational/commercial users, do not harm the natural fish habitat.

Prior assessment and approval of new economic development initiatives (e.g. forestry, pulp and paper, mining, transportation) ventures — that impact on fish habitats — are critical for ensuring that the proposed development and its planned operation will not be deleterious to the fish habitat. DFO assesses proposed projects for their concurrence with legislative and regulatory provisions vis-a-vis fish habitat protection. And, as part of its habitat protection activities, DFO also carries out selective compliance monitoring.

4.5 Income Support

Human Resources Development Canada administers an Employment Insurance (EI) program that is specifically focussed on the needs of unemployed fishers. All fishers who qualify are entitled to receive up to 26 weeks of benefits. There is a rate of 55 per cent (of their weekly earnings) for most claimants. For claimants with low income and dependents, their rate could be up to 65 per cent in 1997.

The provision of this EI assistance cushions fishers from losses in income due to unemployment. The availability of the assistance also enables many fishers to maintain their attachment to the fishing industry.

4.6 Infrastructure

Mandated under the Fishing and Recreational Harbours Act, DFO has long had a policy of providing capital and operating assistance, as well as management, for many smaller harbours across Canada. Under its Small Craft Harbours (SCH) program, the department is currently responsible for a national system of about 1,160 commercial fishing harbours. These harbours serve about 90 per cent of Canada's commercial fishing fleet, with important economic tie-ins to processing and marine services sectors. More than two-thirds of these fishing harbours are located in Atlantic Canada — where most of them are found in small communities or isolated areas, usually prosecuted by small boats.

DFO leases property and infrastructure to Harbour Authorities (i.e. volunteer, not-for profit, client-run corporations) and transfers to them the day-to-day management and operations of a harbour. Harbour Authorities collect revenues from the users and retain them to cover operating and minor maintenance costs. The related DFO responsibilities are for the provision of technical support and the funding of major maintenance work. Over 60 per cent of commercial fishing clients now operate from about 500 Harbour Authority sites with an expected

growth rate of 50-75 sites per year to a maximum of 700-800.

The Harbour Authority management model has become the prerequisite for continued federal contributions to harbour upkeep and the key to the rationalization strategy. In other words, the SCH program will phase out over time its financial contributions for those fishing harbours where the community is not prepared to take on the primary management responsibility.

4.7 Inspection

Reporting to the Minister of Agriculture, the Canadian Food Inspection Agency (CFIA) has responsibilities for food safety, plant protection and animal health.

CFIA has a Fish, Seafood and Production Division whose responsibility is to develop and promote appropriate product and process standards that contribute to the achievement of acceptable quality, safety and identity of fish and seafood products, and to provide reasonable assurance of compliance with these standards.

Among its activities, the Division undertakes the following:

- development of standards
- ensuring industry compliance with standards
- inspection of fishing vessels, facilities for offloading and holding of fish prior to processing, vehicles used in transportation of fish, fishers packer facilities, cold storages and processing facilities
- inspection of fish and seafood imports
- maintenance of databases on contaminants in fish and fish products

4.8 Market Access and Promotion

a) Trade Negotiations and Market Access

DFO maintains a trade capacity within its organisation. In keeping with this, a small number of staff have the responsibility for trade policy which will improve market access for Canadian fisheries exports and defend DFO policy and programs against trade challenges by foreign countries. This trade responsibility is carried out in close cooperation with the Department of Foreign Affairs and International Trade (DFAIT). Often DFO takes the lead on the analysis and on the discussions with fisheries partners whereas DFAIT often takes the lead on international negotiations, particularly where they are part of a wider set of negotiations (i.e. involving many products other than fish products). The DFO work in this area is designed to help advance the economic interests of the Canadian fisheries sector as a whole. This trade assistance is not company-specific and it does not provide financial assistance or subsidies.

AAFC has been assigned the lead for the market promotion of food products, including seafood products. While AAFC does not have a funded program, it provides information and

some other services to exporters.

b) Freshwater Fish Marketing Corporation

The Freshwater Fish Marketing Corporation (FFMC) was established in 1969 under the authority of the Freshwater Fish Marketing Act. The Act gives the FFMC the exclusive right to inter-provincial and export trade in designated products of the freshwater fisheries supplied from the three Prairie Provinces, the Northwest Territories, and part of northern Ontario.

The objectives of the Corporation are: to market fish in an orderly manner; to increase returns to fishers; and to promote markets and export trade in fish. The Act requires the FFMC to purchase all legally caught fish offered for sale by licensed fishers, subject to price and terms and conditions of purchase (including quality provisions). It must conduct its operations on a self-sustaining financial basis without appropriations by Parliament. The FFMC is a federal crown corporation that reports to the Minister of Fisheries and Oceans.

4.9 Aboriginal Programs

In 1992, DFO launched the Aboriginal Fisheries Strategy (AFS) which is applicable where DFO manages the fishery and where land claim settlements have not already put a fisheries management regime in place. Under the AFS, the department enters into agreements with First Nations to establish a regulatory framework for the management of their fishery. Such agreements contain:

- a harvest allocation to the Aboriginal group
- terms and conditions which will be included in the communal fishing licence
- arrangements for the co-management of the Aboriginal fishery
- cooperative management projects for the improvement of the management of the fisheries
- a commitment to provide commercial fishing licences and/or other economic development opportunities

Funded annually at $32 million, about 125 AFS agreements have been signed each year since the implementation of the program. Approximately two-thirds of these agreements are reached in DFO's Pacific Region, with the balance being in Atlantic Canada and Quebec.

An integral part of the AFS is the Allocation Transfer Program (ATP). This program facilitates the voluntary retirement of commercial licences and the issuance of the licences to eligible Aboriginal groups in a manner that does not add to the existing effort on the resource, thereby providing Aboriginal groups with much needed employment and income. Since 1994-95, when ATP was first launched, 250 commercial licences have been issued to Aboriginal groups. In addition, approximately 5,000 seasonal jobs have been created through the AFS in such areas as commercial fishing, processing, monitoring and enhancement activities.

ANNEX III

FORESTRY: INDUSTRY-SPECIFIC PROGRAMS AND SERVICES

1. THE FOREST INDUSTRY

According to CFS, "forestry is Canada's most important industry".

In 1998, the Canadian forest sector contributed 2.4 per cent to the country's gross domestic product. Total shipments exceeded $70 billion and exports were almost $40 billion. Canada is the largest exporter of forest products in the world. In 1998, the forest sector generated 877,000 direct and indirect jobs (involving 1 in every 16 Canadians). New capital investments in the industry totalled close to $3.7 billion. Some 350 communities in Canada are primarily dependent on the forest sector.

2. FEDERAL-PROVINCIAL JURISDICTION

The Constitution provides that forest management on provincial land is a responsibility of provincial governments. Each Province has its own forestry legislation, regulations, standards and programs through which it controls harvesting rights and resource management responsibilities. The federal government can also affect forest management and the forest sector in that it has direct or shared responsibility for industrial and regional development, trade, international relations, taxation, science and technology, the environment, national statistics, national parks and fisheries.[8]

3. NATURAL RESOURCES CANADA

At the federal level, the lead responsibility for the forestry sector is entrusted to Natural Resources Canada (NRCan), and within that department, to the Canadian Forest Service.

3.1 NRCan's Mission

"Natural Resources Canada provides the knowledge and expertise for the sustainable development and use of Canada's natural resources and the global competitiveness of the resource and related sectors for the well-being of present and future generations."

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[8] Source: Auditor General of Canada: "1993 Report of the Auditor General"; Chapter 16, "Department of Forestry"; Ottawa; 1993

3.2 NRCan's Business Lines

NRCan consists of five sectors — the Canadian Forest Services (CFS), the Minerals and Metals Sector, the Energy Sector, the Corporate Services Sector, and the Strategic Planning and Coordination Branch. The Department has four business lines based on sustainable development and good governance, those being:

a) Developing Federal Policy and Regulation

NRCan develops natural resource policies and strategic frameworks, and administers regulations related to minerals and metals, forests and energy. The Department is a major contributor to the government's S&T strategy. It advises other departments on issues such as land claims and tax policies.

b) Promoting Canada's International Interests

One of NRCan's objectives is to meet Canada's international commitments while securing access to the global market for Canadian products and services.

c) Science and Technology

NRCan participates actively in S&T research, and transfers information and knowledge to its clients and partners. The objective is to contribute to the wise and efficient use of Canada's resources while creating new products and technologies.

d) Knowledge Infrastructure

In partnership with provincial governments, universities and the private sector, NRCan continues to build a national knowledge infrastructure, that being a rich database of technical, scientific, economic and geographic information that the public can access.

3.3 CFS's Responsibilities

The Canadian Forest Service (CFS) promotes the sustainable development of Canada's forests and the competitiveness of the Canadian forest sector for the well-being of present and future generations of Canadians. As the premier forestry S&T research and national policy coordination agency in Canada, CFS plays a pivotal role in:

- building a consensus on key forest issues;
- shaping national and international forest agendas; and,
- generating and transferring knowledge through its world-class forestry research.

CFS's policy development and S&T research programs are delivered through a headquarters establishment and ten national science research networks operating out of five forestry research centres across Canada. CFS has a budget of about $100 million per year, about three-quarters of which is science-based.

4. FORESTRY PROGRAMS AND SERVICES

The immediately following sections of this report deal (almost exclusively) with the key industry-specific programs and services provided by NRCan, as the lead department for forestry, in support of that industry. These programs and services are grouped under the headings of:

- science and technology
- forest management
- economic analysis and policy
- market analysis and promotion
- Aboriginal programs

4.1 Science and Technology

The Canadian Forest Service (CFS) Science and Technology Program involves research into most areas of forest resource management and it is focused on the development of knowledge and tools for sustainable forestry development. The program is delivered by five CFS research centres across Canada and through ten component networks, those being:

- The Forest Health Network which focuses on research, monitoring, interpretation and reporting of changes in the health of Canada's forests.

- The Forest Ecosystem Processes Network which conducts research to determine how fundamental ecological processes affect the productivity and resilience of forest ecosystems.

- The Tree Biotechnology and Advanced Genetics Network which generates knowledge and technology based on life processes that apply to the improvement of quality, productivity and health of trees and studies their use.

- The Pest Management Methods Network which advances the development of ecologically acceptable methods for managing forest pests and contributes to integrated pest management and sustainable forest management.

- The Fire Management Network which increases the understanding and ability to manage wildland fire.

- The Effects of Forestry Practices Network which assesses and develops forestry practices for use in the sustainable management of the Canadian forest.

- The Socio-Economic Research Network which provides socio-economic research.

- The Climate Change Network which provides Canadian expertise on the impact of climate change on forest ecosystems and forest-based mitigation and adaptation options.

- The Landscape Management Network which develops the scientific understanding and decision support tools to assist in decision-making.

In delivering on this program, CFS forges partnerships with federal departments and agencies (e.g. NSERC, SSHRC), industry, universities, provincial and territorial governments, and private research institutes (e.g. Forintek Canada Corp, FERIC, Paprican) to deliver on its S&T program. In so doing, CFS ensures that its research is in sync with the R&D needs of forest sector stakeholders. Research collaboration also ensures that the knowledge and technologies, as developed by CFS, are transferred quickly to resource managers and decision-makers.

A new National Advisory Board on Forest Research (NABFOR) provides CFS, its S&T networks and partners with strategic recommendations on forest research needs, directions, priorities and coordination.

Some recent examples of collaborative initiatives under the S&T program are the following;

- in collaboration with Forintek Canada, the development of a new and improved method for cutting veneers used in plywood and laminated veneer lumber
- in collaboration with Forintek Canada, the development of a Video Tooth Inspector System to help lumber mills
- in collaboration with various partners, the development and transfer of integrated pest management strategies and decision support models to control serious forest pests such as spruce budworm, gypsy moth, birch leafminer and others.

4.2 Forest Management

Under the Model Forest Program, CFS has worked with various partners to set up eleven model forests in Canada where sustainable forest management (SFM) practices can be tested and demonstrated.

The objectives of the Model Forest Program are:

- to encourage the development of forest management systems that demonstrate the practical application of the concepts of sustainable forest management (SFM);
- to establish acceptable indicators of SFM;
- to promote the dissemination of the results and knowledge gained through the program; and,
- to encourage Model Forest Participants to work together as a network.

Partners involved in each of Canada's 11 model forests, and organizations outside of the program, are voluntarily adopting innovative approaches to sustainable forest management, for example, the use of alternative harvesting practices.

4.3 Economic Analysis and Policy

a) Economic Research and Analysis

CFS conducts economic research and analysis in the area of forest products. Some examples of research and analysis include: analyzing the industry's competitiveness; creating economic models for the forestry sector; and, examining trends in supply and demand and in the structure of the North American market.

Such information contributes to the development of balanced, cost-effective and well-targeted trade policies and industrial development strategies. The data also will give the forest sector vital information on emerging developments in the global marketplace. This information helps the sector to foresee the long-term effects of these trends on investment opportunities.

b) National Forestry Database Program

The Canadian Council of Forest Ministers (CCFM) founded the National Forestry Database Program (NFDP) in 1990 to establish a comprehensive forestry database, to develop a public information program, and to provide forestry information to the Federal-Provincial-Territorial parties for policy purposes. CFS maintains the basic database and responds to related questions from the public.

c) Industry Development Policy

CFS collaborates with various partners in order to support the continued development of the forest industry. For example, CFS seeks industry input on forestry policy matters through the Forest Sector Advisory Council. This committee of senior industry executives advises the Ministers of Natural Resources Canada and Industry Canada. CFS also works with the industry to identify emerging market trends and opportunities.

4.4 Market Access and Promotion

a) Trade Analysis and Negotiations

CFS has a responsibility to ensure that critical export markets remain open to forest products from Canada and that new markets are developed. CFS contributes to initiatives to liberalize international trade. It acts to protect the legal rights of Canadian exporters when trade disputes arise. It ensures that the trading system considers Canadian circumstances and maintains the principles of free and fair trade. In delivering on this responsibility, CFS works in partnership with other government departments, domestic organizations and Canada's international trading partners.

To deliver on its "market access" responsibilities, NRCan employs a number of techniques, including:

- trade and investment missions overseas
- international conferences
- negotiation of agreements, MOUs
- resort to dispute resolution mechanisms
- provision of expert advice

b) International Forestry Partnership Program (IFPP)

This program was initiated in 1992 by the Canadian Council of Forest Ministers (CCFM) so as to counterbalance negative and biased information disseminated in Canada's key export markets. It was first funded for a three-year period (1993-96) but has since been renewed for a five-year period (2000-05). The objectives of IFPP are to:

- position Canada as an environmentally-responsible forestry nation;
- secure a reasonable trade network through the promotion of Canadian sustainable forestry initiatives;
- ensure that trade barriers are not erected in export markets; and,
- reinforce market acceptance of forest products as a viable and renewable choice.

The program is delivered by CFS although CCFM Deputy Ministers act as the Management Board for the program. Every year, CFS and the Department of Foreign Affairs and International Trade (DFAIT) sign an agreement under which DFAIT, through its embassies, carries out approved activities in export markets, at present the United States, Europe and Japan. Almost all IFPP funding is used for these additional DFAIT activities. All jurisdictions in Canada, including CFS, pay salary and other domestic expenditures from their budgets.

The IFPP hosts missions to Canada by foreign decision-makers and trade delegates, organizes visits by Canadian experts (mostly scientists) to foreign markets and distributes factual information about sustainable management practices in Canada.

4.5 Aboriginal Programs

The First Nation Forestry Program (FNFP) is a five-year, joint $25 million initiative between NRCan and the Department of Indian and Northern Affairs. It is a national program that supports First Nations in their pursuit of economic self-sufficiency through various forest-related initiatives. Eligible recipients are Indian band councils and tribal councils, First Nation organizations and any other First Nation group or company involved in improving economic conditions in status Indian communities who can contribute to the objectives of the First Nation Forestry Program.

The FNFP has four objectives, those being:

- to enhance the capacity of First Nations to operate/participate in forest-related businesses and to increase the number of long-term jobs for them;
- increase First Nations cooperation and partnerships;
- to investigate the feasibility of trust funds, capital pools or similar mechanisms that may become available for the purpose of financing First Nations forestry development; and,
- to enhance the capacity of First Nations to sustainably manage reserve forests.

All approved projects are implemented through formal contribution agreements between the relevant parties.

ANNEX IV

LIVESTOCK: INDUSTRY-SPECIFIC PROGRAMS AND SERVICES

1. THE INDUSTRY

The meat and meat products (excluding poultry) industry, with annual shipments of $10.8 billion in 1998, was the largest industry in the Canadian food manufacturing sector. In the year 2000, farm cash receipts from:

- the sale of cattle and calves totalled $6.6 billion;
- the sale of slaughter hogs (from 13,500 farms) totalled $3.4 billion; and,
- sheep production (from 10,000 farms) totalled $79 million.

In 2000, the exports of red meat and live animals from Canada were valued at $5.3 billion.

Canada's meat processing industry makes a wide variety of meat products ranging from fresh or frozen meats to processed, smoked, canned and cooked meats — as well as sausage and deli meats. About 70 per cent of the processed meats in Canada are made with pork.

2. FEDERAL-PROVINCIAL JURISDICTION

Under the Constitution, agriculture is an area of concurrent or shared jurisdiction. This means that both the federal and provincial legislatures may pass laws in relation to agriculture, although in the event of a conflict, the federal law would prevail. The exercise of the federal spending power has also enabled the federal government to intervene significantly in the agricultural sector. The jurisdictional division favoured by the courts seems to have been between federal regulation over trade and commerce and provincial regulation over property and civil rights — leaving little room for a special agriculture jurisdiction as such.

The reality is that both levels of government are usually involved directly or indirectly in the policy process affecting most issues in the agricultural sector. Both levels of government have Ministers and Departments responsible for agriculture. Both levels of government deliver programs and services in support of the agriculture sector. The two levels of government attempt to minimize duplication and overlap. Close federal-provincial relations and cooperation are the way of doing business.

3. AGRICULTURE AND AGRI-FOOD CANADA

The Minister of Agriculture is responsible for all matters relating to agriculture. This

includes supporting agriculture productivity and trade, stabilizing farm incomes, encouraging research and development, and being responsible for the inspection and regulation of animals and plant-life forms. The Minister also has the responsibility for coordinating rural development and enhancing the quality of rural life.

The organizations within the portfolio of the Minister of Agriculture are:

- Department of Agriculture and Agri-Food Canada (AAFC)
- Canadian Dairy Commission (CDC)
- Farm Credit Corporation (FCC)
- Canadian Food Inspection Agency (CFIA)
- National Farm Products Council (NFPC)
- Canadian Grain Commission (CGC)

3.1 AAFC Mandate

As will be noted from the department's mandate statement (see below), AAFC is very much committed to supporting the economic development of its industry sector, including the livestock industry.

Mandate Statement

"To maximize agriculture's contribution to Canada by creating a vigorous business environment in which the industry can flourish and grow.

"A strong agriculture and agri-food sector is a growing, competitive and market-oriented sector that is profitable, and responds to the changing needs of Canadians.

"The department's measure of success is the contribution of the sector to meeting Canada's economic, social and environmental objectives."

3.2 Business Lines

AAFC has four business lines, three of which are directly related to the economic performance of its client industry sector. Those three business lines read as follows:

- Expanding Markets: This business line's objective is to work with industry and other partners to improve and secure market access and enable the agri-food sector to capture opportunities for trade in domestic and export markets, with a focus on higher-value agri-food products; and, to increase domestic and foreign investment in the sector.

- Innovating for a Sustainable Future: This business line's objective is to work with industry and other partners to support the sector's efforts to develop and produce

competitive products and processes in an environmentally sustainable manner.

- Strong Foundation for the Sector and Rural Communities: This business line's objective is to work with industry, Provinces and other partners to enhance the sector's economic viability, while strengthening opportunities for rural economic development.

4. LIVESTOCK PROGRAMS AND SERVICES

In the following sections, we will review the key programs and services that: (i) are provided by Agriculture and Agri-Food Canada (and some of its sister agencies); and, (ii) provide some assistance to the Canadian livestock industry. We group these programs under the headings of:

- research and development
- loans and debt management
- income support
- farm management and safety
- inspection
- trade and marketing
- livestock-specific programs
- province-specific programs
- Aboriginal programs
- youth programs

4.1 Science and Technology

The livestock industry derives considerable benefit from the research program of Agriculture and Agri-Food Canada (AAFC) and also from its R&D Investment Matching Initiative.

a) AAFC Research Program

The Research Branch of the department undertakes a wide range of research that is designed to:

- improve the ongoing competitiveness of the Canadian food and agriculture sector;
- develop and transfer innovative technologies to make the agri-food industry a strong sector of the economy; and,
- uphold the environmental sustainability of the nation's resources.

Some examples of ongoing activities under the departmental research program are the following:

- studies on the impact of agri-food research and development activities on the sector
- research on new animal production and production systems in eight research centres across the country (e.g. development of the Hog Environmental Management Strategy)
- research on value-added food products
- jointly funded research on projects with commercial applications, in partnership with the private sector under the Matching Investment Initiative (MII) — see below.

b) R&D Matching Investment Initiative

The agri-food R&D Matching Investment Initiative is designed to increase collaborative research activity between the private sector and AAFC. Under this program, AAFC will match industry's R&D contributions to collaborative research projects up to a maximum of one-for-one. This program stretches the industry's research dollar and also ensures that the department's research priorities accurately reflect the sector's real needs. The program also helps speed up the transfer of technology from the government to the industry. With government funding of $35 million per year, there is the potential to achieve government-industry spending of $70 million per year on collaborative research in the agri-food and agricultural area.

4.2 Investment Financing and Debt Management

The Canadian livestock industry benefits considerably from various loan and debt management programs offered to the agricultural sector by the Farm Credit Corporation and by AAFC.

a) Farm Credit Corporation (FCC)

FCC is dedicated exclusively to financing the needs of Canada's primary producers and small to medium-sized agribusiness. FCC also plays a public policy role, delivering federal programs and services that meet the unique needs of agriculture. FCC maintains about 100 field and district offices.

FCC can lend money for any farm-related purposes, such as: land, buildings, equipment, land improvements, quota, livestock, agribusiness or value-added enterprises and diversification initiatives. Loans are made along four major lines:

- AgriStart for beginning and developing farmers, including the transfer of farming operations from one generation to another, as well as assisting developing farmers in starting or expanding their operations;
- pre-approved loans;
- loans for equipment and livestock, using security other than real estate; and,
- loans for value-added processing and farm diversification projects.

FCC has one program that applies specifically to the livestock industry, that being the

Feeder Finance Program. Under the latter, FCC finances feeder livestock through several business alliances, as well as numerous feeder finance cooperatives across the country.

The FCC also has loan products for aquaculture (salmon, freshwater fish and shellfish operations) and for some forestry activities (e.g. buying forestry equipment, expanding existing forestry operations, buying land or transacting a mega-merger).

b) Farm Improvement and Marketing Cooperatives Loans Act (FIMCLA)

The Farm Improvement and Marketing Cooperatives Loans Act is a federal guaranteed loans program designed to increase the availability of loans for the purpose of the improvement and development of farm buildings and the processing, distribution or marketing of farm products by cooperative associations. Also eligible are investments in livestock, new machinery and technology. Under the program, AAFC will pay the lender 95 per cent of a loss sustained as a result of a loan made, provided that the requirements of the Act and the regulations have been met.

Established in 1988, FIMCLA has helped more than 130,000 farmers and their marketing cooperatives grow their businesses by guaranteeing loans through lending institutions. Individual farmers, farm partnerships and farm corporations can apply for up to $250,000 under FIMCLA while up to $3 million is available for cooperative associations. Borrowers benefit from advantageous interest rates, lower equity requirements and attractive repayment terms.

c) Farm Debt Mediation Service

The Farm Debt Mediation Service provides insolvent farmers (including livestock farmers, cooperatives, other associations) and their creditors — with mediation services pursuant to the federal Farm Debt Mediation Act (FDMA) and regulations — to help them arrive at a mutually satisfactory arrangement. The service is a private, confidential and economic alternative the often costly, public and drawn-out process of resolving insolvency disputes in the courts. Where this is not possible, the parties still have recourse to the courts.

d) Farm Consultation Service

The Farm Consultation Service (FCS) is a complementary program to the Farm Debt Mediation Act (FDMA). It provides confidential financial management counselling to farmers through a pathfinding/referral service and a direct, one-on-one financial management service. For a nominal fee, the service provides qualified counsellors who understand farming and farm businesses to work with Canadian farmers (i.e. who are experiencing financial problems) to prevent more serious financial problems.

4.3 Income Support Programs

The livestock industry shares with other agricultural industries (e.g. grains, horticulture) in benefitting from a number of income support programs that are offered by AAFC, often in

partnership with the Provinces. The key programs of this nature are often known by their acronyms — NISA, CFIP and AIDA.

a) Net Income Stabilization Account (NISA)

The Net Income Stabilization Account (NISA) is a voluntary program developed jointly by AAFC, participating provinces and producers. In Quebec, the federal government provides funding in lieu of NISA to support a provincial farm income stability program.

The NISA program is designed to help producers achieve long-term farm income stability on an individual basis. By providing producers the opportunity to deposit money annually into their NISA account and receive matching government contributions, their NISA account grows. In lower income years, the producers can make withdrawals from the funds that they have set aside.

Producers make deposits at the financial institution where they have opened a NISA account. The deposit will then be matched by the federal government and the participating provincial governments. There are 18 participating financial institutions accepting and holding NISA accounts.

b) Canadian Farm Income Program (CFIP)

CFIP is a national program designed to target assistance to Canadian producers in the participating provinces who have experienced a sudden and severe drop in farming income for reasons beyond their control. The program is in place for the 2000, 2001 and 2002 tax years. The program is shared on a 60:40 basis by federal and provincial governments and a total of $2.2 billion is available to farmers over the three years.

c) Agricultural Income Disaster Assistance (AIDA)

The Agricultural Income Disaster Assistance (AIDA) program is a two-year national program designed to provide assistance to producers facing dramatic income declines as a result of factors beyond their control and for which existing programs cannot provide assurance of continuing the farm business. The program takes a "whole-farm" approach. All commodities (including livestock) are covered.

Funded 60 per cent by the federal government and 40 per cent by provincial governments, AIDA is open to individuals, farming corporations and co-operatives, and trusts filing a farm income tax return (and supplementary information) and whose gross margin has dropped below 70 per cent of their historical three-year average gross margin. For beginning farmers, a special calculation is used to determine eligibility.

A cap is placed on payments. The federal share is based on a cap to individuals that will not exceed $175,000. Payments to corporations or cooperatives reflect the number of shareholders or members, to a maximum of five. Caps for the provincial share are determined by

the provincial program and they may affect the total received by the applicant.

The federal government, through Agriculture and Agri-Food Canada, has allocated $1.07 billion for the delivery of AIDA.

4.4 Farm Management Programs

The livestock industry in Canada can benefit from some of the business management and safety programs that are offered by AAFC. Three important programs of this nature are described below.

a) Canadian Farm Business Management Program (CFBMP)

Initiated in 1992, CFBMP is a partnership program involving AAFC, the Provinces and producers. The objective is to assist farmers to upgrade their business management skills leading to improved competitiveness in domestic and global markets — and to improved financial viability of existing farm operations. Federal funding is provided under the Canadian Adaptation and Rural Development (CARD) Fund.

Among other activities, CFBMP is concerned with:

- the design, development, testing and introduction of farm business management development activities;
- communicating farm business management information;
- the design, development and testing of farm business management programs and delivery methods for use by trainers and counsellors; upgrading the skills of farm managers and workers; and,
- FBMInet, an Internet information system designed around the needs of farmers.

b) Industry-Led Adaptation Councils

Industry-adaptation councils have been established across Canada in every province and territory under the Canadian Adaptation and Rural Development (CARD) Fund. The councils work in partnership with government and industry to promote adaptation and diversification in the agriculture and agri-food sector. Councils identify and select projects that reflect local priorities and administer their funds. AAFC provides the financial backing and decision-making authority.

The benefits from this program include: better access to capital; environmental sustainability; improved market access; new management skills; high quality safe food; and, better infrastructure (including improved access to information and technology).

c) Disease Eradication, Control and Compensation

Under the Health of Animals Act, the Minister of Agriculture and his department have responsibilities and authority in respect of diseased animals. This includes authority: to declare animals or property to be infected; to make regulations for the control of disease; to seize infected animals; to carry out searches; and, to order the disposal of animals or things suspected of being contaminated or exposed to disease or toxic substances.

In keeping with the latter authority, the Minister is also empowered to compensate the owners of animals if the destruction of those animals is ordered. The legislation allows the Minister to provide a level of compensation equal to the animals' market value (i.e. if the destruction of the animals had not been ordered). The Minister can also compensate for the costs of disposal of the diseased carcasses.

While the basic objective of the Health of Animals Act is to ensure the safety of the animals and to provide protection for consumers, the compensation feature is of critical importance to the economic viability of the industry and its investors.

d) Canadian Agriculture Safety Program (CASP)

CASP is a four-year, $4 million program with funds from the Canadian Adaptation and Rural Development Fund. The program objective is to lower the incidence of agriculture related deaths and injuries with the implementation of preventative initiatives.

4.5 Inspection

Reporting to the Minister of Agriculture and Agr-Food, the Canadian Food Inspection Agency (CFIA) has responsibilities for food safety, plant protection and animal health. Two of these responsibilities have significant bearing on the livestock industry.

In working with the livestock and meat processing industry, CFIA activities include the following:

- registration and inspection of slaughter and processing establishments and meat products
- inspection and grading of exports and meat products for interprovincial trade
- inspection of import meat products
- process, formula, labelling policy and program development, registration and verification
- verifying that food advertising complies with requirements
- retail inspection including forcing label regulations at retail
- residue testing

4.6 Trade Access and Marketing Programs

The livestock industry is one of AAFC's industry clients that benefits from various trade

and marketing programs and services offered by the department. In the following sections, we review six such programs/services.

a) Agri-Food Industry Market Strategies (AIMS)

AIMS is an inter-departmental initiative to encourage Canadian agri-food industries to increase exports by the development and implementation of market responsive strategies. Eligible for assistance (both financial and human resource) are national associations and regional/provincial associations. The participating federal departments and agencies are: AAFC, Department of Foreign Affairs and International Trade, the Atlantic Canada Opportunities Agency, Western Economic Diversification, and, Canada Economic Development for Quebec.

b) Agri-Food Trade Program (AFTP)

The Agri-Food Trade Program (AFTP) is a cost-shared contribution program designed to support Canadian agri-food industry in areas of market access, market development and investment. The objective of AFTP is to maintain or increase sales of agriculture, food and beverage products in domestic and foreign markets and to thereby contribute to maintaining or increasing investment in the industry in Canada.

The program gives priority to projects which are part of a long-term industry export strategy, implemented through industry associations or alliances, as well as through industry associations and alliances participating in the Agri-Food Industry Market Strategies (AIMS) process. Funding from AFTP will normally not exceed 50 per cent of eligible project costs. The following are examples of eligible projects:

- Market Access
  - developing international standards which impact on Canadian trade
  - increasing awareness of issues related to WTO negotiations

- Market Development
  - formation and development of new alliances and industry associations
  - development of strategic plans
  - support for pursuing new market opportunities
  - showcasing Canadian products

- Investment
  - formation of strategic partnerships and alliances
  - development of strategic plans
  - facilitation of partnerships between domestic and foreign firms

c) Price Pooling Program

The Price Pooling Program is a market development program designed to assist and

encourage cooperative marketing of eligible agricultural products, including processed products. The program provides for initial payment to producers for products delivered to the pool. It also covers costs incurred by the agency for products sold under a cooperative plan. The program provides a price guarantee that protects the marketing agencies and its producers against unanticipated declines in the market price of their products. Producers can benefit from the program through six marketing agencies currently administering it. The program would also be open to existing or newly developed marketing agencies.

d) Agricultural Products-Markets Information Program

This program provides the agri-food sector with daily, weekly, monthly and annual market information on agricultural products. This information helps agri-food businesses make better production and marketing decisions, and is also used by decision-makers at all levels of government.

This program provides information through annual publications, and computer through Internet access. Either way, users can access prices, sales, volumes, production, inventories and product movement information on four major agricultural sectors: livestock and red meat, poultry, dairy and horticulture. Users can also obtain some statistics on Canadian agricultural exports and imports.

In the area of livestock, reports are available via the department's Internet site on the following subjects: livestock and meat trade; red meat supply; cattle on feed; livestock market.

e) Agri-Food Trade Service (ATS)

The Agri-Food Trade Service is an international business development service that provides: a focal point for Canadian agri-food exporters; simplified access to international market information/intelligence; trade and investment counselling and advice; and, export support programs. ATS consists of a multitude of initiatives such as the ATS website, Agri-Food Trade program, agri-food specialists abroad, trade show support, agri-food export trade training, and priority and emerging markets action plans.

ATS is delivered by staff of AAFC's Market and Industry Services Branch — in cooperation with staff of the Provinces and other federal departments.

f) Marketing Loan Guarantees

As noted above, AAFC provides loan guarantees under FIMCLA so that lending institutions will provide loans to agricultural cooperatives for a variety of purposes, including market development.

4.7 Livestock-Specific Programs

a) Community Pasture Program

This program, delivered by the Prairie Farm Rehabilitation Agency (PFRA), provides 87 community pastures in the three prairie provinces. The program allows livestock producers to strengthen their operations by providing pastures and a breeding service to them. There are fees charged to all the users of the community pastures. The program also is designed to protect wildlife habitat and maintain a permanent cover that protects marginal soils from erosion.

b) Beef Industry Development Fund (BIDF)

Established in 1994, this Fund provides assistance for: domestic and international market development; technology training initiatives; and, new research initiatives. The overall objective of BIDF is to work with industry and research organizations to support innovative projects that what will increase the competitiveness of Canadian beef domestically and abroad. Expenditures under the program are not to involve direct support to producers or processors.

BIDF is administered jointly by AAFC and the Provinces. The Canadian Cattlemen's Association serves as a secretariat and it receives applications for BIDF.

c) Canadian Dairy Commission (CDC)

The Canadian Dairy Commission, a federal crown corporation, plays a central facilitating for the multi-billion dollar Canadian dairy industry (i.e. including producers, processors and exporters). The CDC provides supply management services for the milk industry, setting national milk production targets, assigning quotas, setting support prices, etc. The CDC administers the federal government's subsidy to dairy producers; that subsidy (set at $83 million in the 1999-2000 dairy year) will be completely phased out by January 31, 2002.

4.8 Province-Specific Programs

There are a number of federal-provincial Companion Programs (i.e. companion to NISA, CFIP and the Crop Insurance Program) that have been recently designed — and often cost-shared on a 60:40 basis — to meet specific needs in individual provinces. The ones that may provide some benefit to the livestock industry are cited below:

- Industry Research and Development Programs
  - British Columbia: Investment Agriculture
  - Alberta: Development Funds
  - Manitoba: Research and Development
  - Ontario: Development Programs
  - Nova Scotia: Technology 2000
  - Nova Scotia: Promotion and Awareness

- Whole-Farm Disaster Programs

- Alberta: Farm Income Disaster Program
- PEI: Agricultural Disaster Insurance Program

- Transition Programs
  - Ontario: Market Revenue Program

- Other
  - Alberta: Forage Write-Down
  - Manitoba: Livestock Predation Compensation
  - New Brunswick: Debt Refinancing Program
  - Newfoundland: Agri-Food Innovation

4.9 Aboriginal Programs

The Aboriginal Farm Business Pilot Program in Ontario is designed to enhance the economic and employment opportunities for Aboriginal peoples provided by agriculture. The pilot program will assist in the development of a farm management program for Aboriginals; an agricultural program for Aboriginal youth; and, a database covering all aspects of the agricultural industry — all focusing on Ontario First Nations territories. The pilot program will also result in the development of a model with portable features applicable to other Aboriginal communities across the country.

4.10 Youth Programs

The Canadian 4-H program reaches out to both farm and non-farm rural youth and concentrates on technical skill development related to agriculture as well as personal development of life skills in order to develop future entrepreneurs. The Canadians 4-H activities can be grouped into the following sub-objectives:

- to develop entrepreneurial and leadership skills (e.g. farm management, animal science) related to the rural and agri-food sector;
- to contribute to the training of 4-H leaders; and,
- to raise awareness regarding rural and agriculture and food related issues such as farm safety, food quality and nutrition, the sustainability of natural resources, and the relationship between the agri-food sector and the environment.

ANNEX V

BIOTECHNOLOGY: INDUSTRY-SPECIFIC PROGRAMS AND SERVICES

1. THE INDUSTRY

Biotechnology is an umbrella term covering a wide spectrum of scientific tools and techniques, ranging from traditional uses of living organisms, such as yeast in bread, to more advanced techniques such as genetic engineering. Biotechnology uses living organisms or parts of living organisms to make new products or provide new methods of production.

According to some observers, a biotechnology "industry" does not really exist. For example, a 1997 Industry Canada document stated that:

> "Formally there is no such entity as a biotechnology industry. Rather it is a broad, enabling technology that impacts on productivity in a wide range of sectors." [9]

These days, however, Industry Canada today treats the biotechnology area of activity as an industry. In a recent document, the department stated that the biotechnology industry in Canada had revenues which exceeded $1 billion in 1997. The health and agri-food sectors accounted for almost 95 per cent of the sales; smaller amounts were tied to forestry and fisheries. The industry consists of almost 300 core biotechnology firms, one-quarter of which are publicly traded. The industry is very much research-based, with some $600 million in R&D expenditures. Hence the biotechnology industry has one of the highest R&D-to-revenues ratios (i.e. almost 3:5).

2. FEDERAL-PROVINCIAL JURISDICTION

Unlike with some other industries (e.g. fisheries, aquaculture), the Constitution Act does not specifically deal with the biotechnology industry or related jurisdictional matters. Both levels of government have some responsibilities for it and both provide some regulations, programs, services, etc.

3. INDUSTRY CANADA

Industry Canada is the lead department for the promotion of the biotechnology industry.

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[9] Industry Canada; "Bio-Industries: Part 1, Overview and Prospects"; Sector Competitiveness Frameworks; Ottawa; 1997; p.7

Other departments (e.g. Health Canada, Agriculture and Agri-Food Canada, Fisheries and Oceans) are also involved in the parts of the biotechnology industry that focuses on their sphere of interest. Similarly, other departments and agencies with horizontal programs and services (e.g. DFAIT, Environment, National Research Council) are also involved with the industry.

3.1 Industry Canada's Mandate

Industry Canada's mandate calls for the department "to help make Canadians more productive in the global, knowledge-based economy". It also calls for the department to "help create an economy that ... supports stronger business growth through sustained improvements in productivity".

3.2 Strategic Objectives

The department has five strategic objectives that deal with:

- innovation: improving Canada's innovation performance
- connectedness: making Canada the most connected nation in the world
- marketplace: being a fair, efficient and competitive marketplace
- investment: improving Canada's position as a preferred location for domestic and foreign investment
- trade: working to increase Canada's share of global trade.

Even from a quick scan of these objectives, it is clear that the department has a mandate that will enable it, on a number of fronts, to help promote the development of the biotechnology industry in Canada.

3.3 Biotechnology Strategy

In 1983, the federal government launched the National Biotechnology Strategy (NBS) which focused on R&D and human resources development. In the late 1980's, the NBS was broadened to address the regulatory framework for biotechnology. The National Biotechnology Advisory Committee was formed to advise the Minister of Industry on issues related to industry growth and competitiveness.

The federal government has quite consistently expressed its support for biotechnology as a priority (e.g. federal "Science and Technology Strategy" and the "Jobs and Growth Strategy"). In the 1997 Throne Speech, the government identified biotechnology as one of the important knowledge-intensive sectors targeted for future jobs and growth.

In 1997, the Minister of Industry was asked to launch a process to renew the country's strategy for biotechnology. The result of that renewal process was the 1998 Canadian Biotechnology Strategy (CBS) which:

- called for the creation of the Canadian Biotechnology Advisory Committee to advise

Ministers on biotechnology issues, raise public awareness and engage Canadians on the subject;
- set out a policy framework with a vision, guiding principles and strategic goals;
- articulated roles, responsibilities and partnerships;
- set out a CBS workplan; and,
- called for a new Biotechnology Ministerial Coordinating Committee.

In the year 2000, Industry Canada pushed further ahead with its strategic thinking for this industry when it published "Pathways to Growth: Opportunities in Biotechnology". That document set out some new commitments for the industry under the headings of:

- R&D, technology transfer and commercialization
- financing and access to capital
- skills development and human resources
- regulation and intellectual property
- foreign investment and trade

4. BIOTECHNOLOGY PROGRAMS AND SERVICES

In recent years, the Minister of Industry has accorded innovation a major priority. This has considerably helped the biotechnology industry. Some of the related initiatives of his department and agencies are described below under the headings of: research; technology development; regulations; and, other programs.

4.1 Research

a) Genome Canada

Genome Canada is a not-for-profit, national partnership-based scientific enterprise which is spear-heading a national effort to make Canada a world leader in genomics research. Among other things, Genome Canada is developing five world-class genome technology centres across the country to provide technology platforms and find new methods for diagnosing, treating and managing natural resources and food supply. The centres will focus on various structural genomics activities (i.e. functional genomics, genomics sequencing, genotyping, functional proteomics and bio-informatics) as well as major research projects.

The Minister of Industry recently committed $300 million in funding for Genome Canada. On behalf of the government, Industry Canada manages an arms-length relationship with Genome Canada which also has partnerships with the Provinces and industry.

b) National Research Council

The NRC — which reports to the Minister of Industry — has several research institutes that undertake research and technology transfer in areas specifically related to the biotechnology industry and its interests. This includes:

- Biotechnology Research Institute
  to carry out collaborative research projects in molecular biology and biochemical engineering, working with the pharmaceutical and resource sectors
- Plant Biotechnology Institute
  - to perform, assist and promote strategic research in plant biotechnology and to improve/diversify Canadian industry
- Institute for Biological Sciences
  - to perform innovative research in neurobiology and immunochemistry of importance to the health and pharmaceutical sectors
- Institute for Biodiagnostics
  - to perform research related to the diagnosis in human and veterinary medicine and the clinical application thereof

c) Networks of Centres of Excellence

Created in 1989, the NCE Program brings together research teams from all provinces and disciplines to work in cooperation with universities, industry and government on problems of strategic importance to Canada. In February 1997, the government made the program permanent with an annual budget of some $47 million. Under NCE, networks have been established and are supported for limited periods of time. These networks enable prominent scientists to work with industry and other partners, to conduct leading-edge research and to share their expertise with young researchers through innovative training programs. In the federal Budget of February 2001, an additional $94 million was allocated to the program for the next four years.

Some of the centres of excellence that have assisted the biotechnology industry have been the following:

- Canadian Bacterial Diseases Network
- Canadian Genetic Diseases Network
- Protein Engineering Network
- Stem Cell Genomics and Therapeutics Network
- Health Evidence Application and Linkage Network
- Canadian Network for Vaccines and Immunotherapeutics
- Aquanet — Aquaculture network

At the present time, there are 14 networks of centres of excellence across the country. Each one of them has its own network of universities, industry firms, and government departments and agencies.

d) Canadian Foundation for Innovation

The Canadian Foundation for Innovation (CFI) is an independent corporation

established by the Government of Canada in 1997. The Foundation's goal is to strengthen the capability of the Canadian universities, colleges, research hospitals and other not-for-profit institutions to carry out world-class research and technology development. By investing in research infrastructure projects, the CFI supports research excellence and helps strengthen research training at institutions across Canada. With a budget of $3 billion, CFI provides funds for: innovation; new opportunities; infrastructure operation; joint ventures; and, international access.

The biotechnology industry is one of many Canadian industries to benefit from investments made by CFI.

4.2 Technology Development

a) Technology Partnerships Canada

Technology Partnerships Canada (TPC) is a technology funding program which supports Canadian companies involved in research, development and innovation in the a variety of sectors, including biotechnology. The program is administered by Industry Canada. More information is provided on it in Annex VI.

b) Regional Development Programs

The four regional development agencies, which report to the Minister of Industry, undertake initiatives to help foster development in the biotechnology industry. Many of these initiatives help in the area of technology development.

4.3 Biotechnology Regulation

In Budget 2000, the federal government provided $90 million over the next three years to six federal debarments and agencies to improve Canada's biotechnology regulatory system. The investment was intended to ensure that Canada's regulatory system will continue to evolve and to keep pace with biotechnology developments and that biotechnology-based products will be safe and effective.

4.4 Other Programs

The Minister of Industry is responsible for many other programs and services that can be used to benefit the biotechnology industry.

In the area of investment financing, there are the programs of the Business Development Bank of Canada and the small business loans program.

In the area of foreign market access, there are the programs of the Export Development Corporation, the Canadian Commercial Corporation and the trade initiatives of Industry

Canada.

ANNEX VI

SOME INDUSTRY-WIDE PROGRAMS

The federal government offers many industry-wide programs, those being programs that are not targeted on specific industries but rather can apply (upon request) to a wide range of industries. Examples of these industry-wide programs — which are also available to the five industries being reviewed in this report — are given below under the headings of: research and development; investment financing; and, trade support.[10]

1. RESEARCH AND DEVELOPMENT

Some of the key, industry-wide R&D programs of the federal government are offered by: the Granting Councils (NSERC, SSHRC); National Research Council; and, Industry Canada.

1.1 Natural Sciences and Engineering Research Council (NSERC)

NSERC is the national instrument for making strategic investments in Canada's capability in science and technology. NSERC supports: basic university research through research grants; and, project research through partnerships of universities with industry. It also supports the advanced training of highly qualified people in both areas.

NSERC is a separate employer of the Government of Canada, reporting to Parliament through the Minister of Industry. It is governed by a Council of 22 members selected from the private and public sectors, and the universities.

Established in 1978, NSERC has seen its annual budget grow from a base of $112 million to a level of about $550 million. At the present time, NSERC is supporting more than 9,000 students in their advanced studies and it is funding more that 8,700 researchers every year. And, NSERC is helping to make innovation happen by encouraging more that 1,000 companies to invest annually in university research.

1.2 Social Sciences and Humanities Research Council (SSHRC)

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[10] There are other groupings of industry-wide programs and services, such as: human resource programs/services (e.g. literacy, training, employment insurance); tax expenditures; etc.

SSHRC is Canada's funding agency for university-based research and graduate training in the social sciences and humanities[11]. Created as an independent body by Parliament in 1977, it reports through the Minister of Industry. SSHRC is governed by a 22 member Council appointed by government to represent the interests of the academic, public and private sectors.

SSHRC does not conduct research itself. It distributes funds to Canadian researchers, scholars and universities through highly competitive granting activities, in response to applications. Its funding program provides support for: basic research; targeted research; advanced research training; and, research communication and knowledge transfer. SSHRC's annual budget has recently (1998-99) been about $96 million.

1.3 National Research Council (NRC)

NRC, which reports to Parliament through the Minister of Industry, is Canada's premier science and technology research organization. It provides leadership in scientific and technical research, the diffusion of technology and the dissemination of technical information.

Under its research program, NRC operates 16 research institutes, four technology centres and an innovation centre. NRC's research is conducted in areas such as: biotechnology; manufacturing technology; transportation technology; information and communications technology; construction technology; etc. It has five institutes (Montreal, Winnipeg, Ottawa, Halifax, Saskatoon) that are heavily involved in biotechnology research.

Under its technology program, NRC relies very heavily on its Industrial Research Assistance Program (IRAP). The program is designed to enhance the innovation capacity of small-medium sized enterprises (SMEs) so that they can meet the technological challenges they face in delivering new products, processes or services. IRAP links Canadian SMEs with more than 130 public and private research and technology-based organizations across the country. Working together, they can often close the innovation gap for the benefit of the individual firms.

Under its technical information program, NRC delivers much of the related service through CISTI — Canada's Institute for Scientific and Technical Information. CISTI is one of the world's major sources for information in all areas of science, technology, engineering and medicine. Easy to use electronic information tools enable clients to stay on top of new developments in their field.

1.4 Technology Partnerships Canada (TPC)

TPC is a technology investment fund established and delivered by Industry Canada.

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[11] Includes economics, business and administrative studies, ethics, education, law, history, literature, philosophy, anthropology, psychology, sociology, fine arts, native, religious, environmental and women's studies.

TPC advances and supports some of the government's objectives by investing strategically in research, development and innovation in order to: encourage private sector investment; and, maintain and expand the technology base and capabilities of Canadian industry. TPC also encourages the development of small and medium-sized enterprises in all regions of Canada.

TPC supports research, development and innovation in:

- environmental technologies (e.g. development of sustainable alternatives, pollution prevention, pollution abatement, pollution remediation)
- enabling technologies (e.g. advanced manufacturing and processing technologies, advanced materials processes and applications, applications of biotechnology, and applications of selected information technologies)
- aerospace and defence

Eligible activities under TPC include: industrial research; pre-competitive development; and, studies. TPC makes investments in projects that would not otherwise proceed within the desired scope, timing and location. All TPC projects must undergo extensive evaluation by federal officials to determine whether they meet the strategic objectives of the government, including technological and net economic benefits to Canada.

2. INVESTMENT FINANCING

2.1 Small Business Loans Act (SBLA)

The SBLA program, begun in 1961, continues today with essentially the same basic goal: to increase the availability of loans for the establishment, expansion, modernization and improvement of small business enterprises. The program is administered by Industry Canada.

The SBLA applies to most for-profit businesses with sales under $5 million in the year of the loan. Exceptions are farms and organizations of a charitable nature. Farming enterprises are eligible for loans through the Farm Credit Corporation.

Small businesses apply directly to any of the 1,500 authorized private sector financial institutions, including banks, trust companies, caisses populaires and credit unions, with a combined total of some 13,000 branches across Canada. Under the Act, loans are available for the purchase and improvement of premise and equipment, and for the purchase of land. They cannot be obtained for share acquisition, working capital, existing debt, real estate purchase for resale, goodwill or other intangibles.

The lender administers the loan like any other. If it is repaid without trouble, there is little further involvement by the government. And, about 94 per cent of loans made since the program began have been fully repaid with no cost to the taxpayer.

If the small business fails, or if the borrower is otherwise unable to repay the loan, the lender is obliged to take the usual steps to mitigate the loss. Once the lender has done so, it can submit to the SBLA administration for loan loss. For claims that are approved by the SBLA administration, the government absorbs 85 per cent of the cost and the lender absorbs the remaining 15 per cent.

2.2 Business Development Bank of Canada (BDBC)

The Business Development Bank of Canada (BDBC) is Canada's bank for small and medium-sized businesses. BDBC plays a leadership role in delivering timely and relevant financial and management services, with a particular focus on the emerging and exporting sectors of the economy. It provides regular term loans, working capital, venture loans, venture capital, seed capital and other financial products up to ceiling of $5 million. It also has a consulting service with a network of nearly 500 independent consultants.

Some services that the BDBC does not provide, include:

- grants/subsidies or non interest-bearing loans
- residential or non-commercial loans
- loans to companies that are in default of environmental regulations and that do not want to comply with them
- loans to companies whose main operations/activities (over 50 per cent) are outside of Canada
- bank accounts, term deposits, investment certificates
- the sale of RRSPs, insurance
- vehicle or equipment leasing

The BDBC's services are available across Canada through a network of more than 80 branches and its head office in Montreal.

3. TRADE SUPPORT

3.1 Export Development Corporation (EDC)

Founded in 1944, EDC is a crown corporation that operates as a commercial financial institution and reports to Parliament through the Minister of Industry. EDC was established to provide trade finance and risk management services to Canadian exporters. It now helps Canadian exporters to succeed in some 200 foreign markets.

Through its financing program, EDC provides export financing (i.e. direct loans, line of credit, equity investments) to buyers of Canadian capital goods and services. This service provides flexible services and payment options to help Canadian companies secure export opportunities abroad.

Through its insurance program, EDC helps Canadian exporters to protect their short-term receivables. The related services include: accounts receivable insurance; bonding products; political risk insurance; and, political risk insurance of loans.

Through its small business program, EDC has specialists to advise small Canadian businesses about export issues, such as: emerging markets; performance bonds; export financing; export insurance; etc.

3.2 Program for Export Market Development (PEMD)

The objective of PEMD — which is administered by the Department of Foreign Affairs and International Trade (DFAIT) — is to increase export sales by sharing the cost of activities that companies could not or would not undertake alone, thus reducing risks involved in entering a foreign market. Through a partnership-like arrangement, the program encourages a long term focus on target markets with enough flexibility to respond to changing market conditions.

The PEMD program has four major and distinct elements, those being: market development strategies; new-to-exporting companies; capital projects bidding; and, trade association activities.

PEMD is a repayable contribution, not a grant, where eligible costs under each of the four elements will be shared (generally 50:50). Repayment is based on incremental sales made by the company or contracts obtained.